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"THE BRITISH EMPIRE"
Edited by Hugh Gunn
The Atlantic & Indian Oceans.

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British territories and Protectorates.
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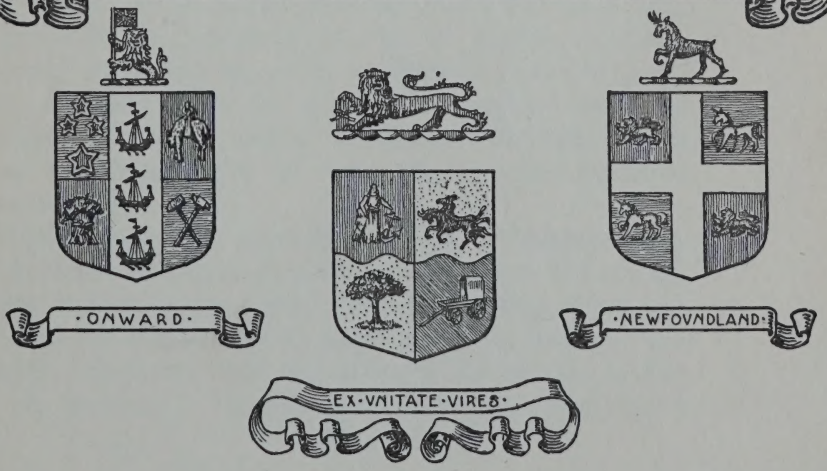
THE BRITISH EMPIRE

A Survey in 12 Volumes—each self-contained

Edited by

HUGH GUNN



INTRODUCTION TO THE SERIES

A WORD is necessary as to the origin and object of this series. The Management of the British Empire Exhibition (1924), in the early days of its organisation, approached the Imperial Studies Committee of the Royal Colonial Institute for advice and assistance in connection with the educational aspect of the Exhibition's work. The Editor of this series, who is a member of that Committee, happened during a period of enforced leisure to be spending a good deal of his time at the Institute, chiefly in its delightful Library. On its shelves he found entrancing reminiscences or records of men who went forth from these islands as Pioneers to brave the perils of uncharted seas and the dangers of unknown lands, inspired more by the spirit of adventure inherent in the race than by any calculated design for personal gain or lust for the acquisition of new territories. From these volumes could be traced the beginnings and gradual growth of remote colonies, through the early stages of awakening public interest, followed perchance by apathy or neglect until the advent of some world movement brought them into the fierce light of economic and international importance.

Though there lay upon the shelves an immense mass of valuable literature on almost every phase of Imperial work, it became apparent to the Editor that there was no series of volumes which gave a complete survey of the history, resources, and activities of the Empire looked at as a whole. He felt that there was need for a

series which would provide the ordinary reader with a bird's-eye view, so to speak, of these manifold activities.

The time seemed appropriate for such a survey. The Empire had emerged victorious from the greatest of wars. The Dominions which had contributed so magnificently to the victory had sprung, as it were, at a bound not only into the consciousness and acknowledged status of full and equal nationhood with the Mother Country, but also into definite recognition by Foreign Powers as great and growing World-Forces.

The decision to hold in London an Exhibition in which the vast material resources and industries of the Empire would be brought vividly before the public seemed also to demand that there should be a record and survey of the growth and development of this far-flung congeries of countries and peoples that are called the British Commonwealth of Nations.

The Editor accordingly consulted some of his friends, and was fortunate in securing their assistance and advice. The Management of the British Empire Exhibition welcomed the scheme as supplementing from the intellectual side what the Exhibition was doing from the material aspect. He has also been fortunate in obtaining the co-operation, as authors, of distinguished men, many of whom have played a foremost part in the public life or administration of the territories concerned, and all of whom have had wide personal knowledge and experience of the subjects which they treat. The Editor's thanks are especially due to these authors. They have undertaken the work from a sense of duty and from a desire to provide, at an important stage in our history, authoritative information regarding the great heritage that has been bequeathed to us, not only unscathed

but strengthened by the stern struggle through which it has passed.

Each volume is self-contained and deals with a special aspect of the Empire treated as a whole. The volumes are, however, co-ordinated as far as possible, and give, it is hoped, a comprehensive survey of the Empire.

The writers have had complete freedom as regards the statement of their views, and it is to be understood that neither the Editor nor his advisers are responsible for such individual expressions of opinion.

The late Sir George Parkin was deeply interested in the scheme, and, but for his lamented death, would have contributed a volume to the series.

The Editor, in conclusion, desires to express his thanks to Lord Morris, and to Sir Charles Lucas, especially the latter, for the benefit of their advice and ripe experience.

HUGH GUNN,
General Editor.

LONDON, *April*, 1924.

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Late Secretary of the Rhodes Trust, who gave valuable assistance until his death.

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THE PRESS AND COMMUNICATIONS OF THE EMPIRE

THE PRESS AND COMMUNICATIONS OF THE EMPIRE

by

J. SAXON MILLS, M.A.

With a Foreword by

THE RIGHT HON. VISCOUNT BURNHAM, C.H.

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FOREWORD

BY

THE RIGHT HON. VISCOUNT BURNHAM

WRITING some forty years ago, Lord Bryce said that the United States of America was the country where public opinion ruled most completely—the public opinion which old Metternich told the Congress of Vienna was a good guide but a bad master. In this country it would not be difficult to show that public opinion counted for at least as much in the self-governing Dominions of the British Crown as in the United States, and it might be plausibly contended that the relative weakness of the political machine in the British Dominions gave even fuller play to the currents of public opinion than in America, to use the term which Americans prefer. In any case, public opinion, if not omnipotent, is very powerful in the British Commonwealth, and all that goes to form and direct it is well worth careful investigation.

The question whether the newspaper press makes public opinion or merely mirrors it, has been discussed, to use the Parliamentary formula, with wearisome reiteration, and every statesman of the last half century has expressed his view of it one way or the other, or not unusually both ways. It seems as difficult to

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answer as the schoolmen's problem of the ass that is equidistant from two bundles of hay. Probably it passes the wit of man to solve it precisely, or even correctly, in terms of quantity and quality. In Congreve's brilliant comedy it is said that a man wants an echo in his wife, and owes to an echo the pleasure of hearing himself talk, and this is no less true of public opinion. It is only its echo that can be heard, and the clearest and fullest echo of public opinion is necessarily to be heard in the newspaper press. As newspapers report and repeat the talk of the town and of the country, they not only give it their own tone and colour, but they draw their own conclusions and they point the moral of the story by their own commentary. So that, as day by day they address their public, they are able so to influence the public mind that, no matter whence came the original impulse, it is driven home and kept there by the unceasing pressure of newspaper publication.

The British Empire justifies the complaint of the old judge a hundred years ago: "We are a newspaper-ridden people." In the United States the Press may have more power and the platform less, but the governments of the constituent dominions are the first to admit that the very existence of the Empire as a co-ordinated—it is hardly possible to say consolidated—whole depends more upon newspaper sympathy and support than upon any other factor in its organisation. Testimony

was brought to this in a striking and unexpected manner by the importunate demands of the war years. Speaking with his intimate knowledge of the *arcana imperii*, Lord Milner, himself of journalistic origin, averred that it would have been impossible to have secured so united an effort from the Overseas Dominions, with all that it meant of sorrow and sacrifice, had it not been for the Imperial Press Conference of 1909, when Lord Rosebery and Lord Roberts revealed to an astonished world the home truths of our unpreparedness amid "so many and great dangers." Before then, without and to some extent within the old country, the newspaper press had been content to accept the official optimism as a sufficient assurance of what was once called "our bagman's paradise," and the newspaper men from overseas had been denied all access to first-hand information at the seat of Empire. It is curious to reflect that before the Great War, and even then only after long-drawn protests from the Empire Press Union, no London correspondent of an overseas newspaper could establish contact with the departments of State, or even with the Colonial Office itself. We have changed all that now, and, even if the methods be open to improvement, journalists who supply the news letters of the Dominion Press are able to fulfil their mission in the full light of official confidence. The Empire Press Union was the direct outcome of the first Imperial

Press Conference, and it is constituted on a confederated system of autonomous branches in the Overseas Dominions, some of the Colonies, and the Indian Empire, which are all linked up to the parent society and work together for common purpose of public usefulness by personal, not less than by formal, communications. All the London representatives of the Overseas Press have seats on the Council, and form a separate committee for considering matters of general concern, so that we have carried Imperial solidarity to a further point in newspaper affairs than it has as yet been found possible to do in our Parliamentary relations. In the typical British fashion, the Union is broadening itself out from precedent to precedent, and has already established strong ties of comradeship and alliance between the Press interests of the Empire.

England is often called the Mother of Free Parliaments; she can be called with equal truth and hardly less honour the Mother of a Free Press. Through many trials and tribulations, the freedom of the Press was set up and secured by the beginning of the nineteenth century in England, after it had been consecrated, like other public liberties, if not by the blood of its martyrs, at least by their standing in the pillory. In Canada, an effective Press was called into being not long after our own, and had to endure the same sort of persecution. Elsewhere, the later development of the other colonies naturally delayed

its institution according to their circumstances. It is not quite correct to say that the Press of the Empire has been wholly standardised on the English model, because American predominance has had its necessary effect on the American continent. It is, however, true to say that all over the world the newspaper press of the British Dominions has preserved the British sense of moderation and fair play, and has held with steadfast bull-doggedness to the tradition of integrity and independence of which the British Press can boast with justifiable self-conceit. Curiously to relate, at the present moment the newspapers of Australia and New Zealand seem to remain more English than the English can pretend to be in these hectic and turbulent times.

Just as the American Constitution reflects the peculiarities of the British Constitution, when the old colonies, which made up the federal union, first adopted representative institutions, so the newspapers of a great part of the Empire still adhere to the make-up and the appearance of the older sort of English newspaper. It may, perhaps, be justly alleged that until the self-governing Dominions were emancipated by the grant of autonomous powers, the English Press did not pay much attention to their interests, but, at least, there never was any movement in the Press against the Empire such as characterised what was known as the Manchester School in Parliament, nor the callous indifference to their

progress and prosperity, which was for so long the settled policy of the old Downing Street, the very name of which grates so harshly on colonial ears. The British Press upheld the Imperial idea some time before it ever appealed to statesmen or permanent officials, and it was often accused of indulging in vulgarities of patriotism from which they were free. The Press has never played the part of the superior person which has always irritated the feelings of our fellow citizens beyond the seas, because where we credited ourselves with caution and common sense, they saw only selfishness and want of vision.

A hundred years ago De Quincey, in his *Suspiria de Profundis*, uttered a prayer for "blessings descending from Heaven by education and accelerations of the Press." Undoubtedly we have effected marvellous "accelerations," and although one may not call them altogether blessed, these accelerations, which wireless telegraphy will assuredly speed up further still, have undoubtedly made for kindliness and good feeling in what Sir Walter Raleigh called "a commonwealth of many families."

BURNHAM.

1*st April*, 1924.

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CHAPTER I

INTRODUCTORY

A VIVID idea of the modern triumphs over space and time may be obtained by a visit to the Central Telegraph Office in London. Here in the ordinary day's routine, miracles are being wrought which, a hundred years ago, would have seemed as remote from possibility as the dreams of a Rosicrucian or the fables of fairyland. One becomes more and more impressed on passing along the files of operators in the great telegraphic room. Here, for example, a business wireless message is just coming in from Cologne, where the British army authorities wisely permit this civil use of their service. Here another magician is launching a message along one of the Imperial cables, that creep along the floor of the Atlantic Ocean. England, who went into the Great War without the control of a single trans-Atlantic cable, soon came into possession of two—the old German Emden-New York line, running via the Azores to Halifax, Nova Scotia, and a line purchased from an American company, which reaches the same terminal via Newfoundland.

Let us follow in fancy this departing message. From Halifax it flashes to Montreal, then along

the " all-red route," across the broad continent to Bamfield in Vancouver Island. Thence it dives under sea again, this time along the British Pacific cable by way of Fanning Island, Suva (Fiji), and Norfolk Island, from which last station the line bifurcates to Australia and New Zealand. And the transit to Sydney or Auckland takes no longer time than the writing of these last few sentences.

Here again, something still more wonderful, and from a political point of view more significant, is taking place. A British foreign office " communiqué," giving the most important news of the day, is about to be " broadcasted " to all points of the compass, and in a few moments from its start, will be picked up in India, South Africa, Australia, and by ships plodding their way along the farthest and loneliest ocean tracks.

Three times a day such an official message is scattered upon all the winds of heaven. It is British news, coming direct from the fountain-head, and is not tainted or perverted, like so much " British news " that reaches British territory, by passing through foreign channels.

Passing on we come alongside where a Press message of several hundred words is on tiptoe for Karachi in Northern India, whence the land wires will forward it to Calcutta, Bombay, Allahabad, and all India. Soon direct wireless will be available to these great centres. And another such wireless message is off westwards

to Halifax, whence by land wires it reaches the newspaper-offices of Canada and the United States.

These are but examples that cling to the memory of the wizardries daily and nightly performed at the central telegraphic office at St. Martin's-le-Grand. When we recall the corresponding wonders that have been wrought in the transmission of human beings and materials and goods by land and sea and air within less than a hundred years of time, we may begin to realise what it all means for the development and destiny of an Empire like the British, whose distinctive feature is its dispersion over every continent and ocean of the world's surface.

To express the results briefly, these triumphs over space and time have made not only possible, but almost inevitable, the cohesion in a single vast political organisation of Dominions and Dependencies sundered by half the world's girth, and displaying every diversity of race and climate and production.

The earliest British settlements on island and continental shore had no sooner won a certain degree of strength and stability, than this question of continued union was posed and debated. Long before the days of cables and swift ocean steamers, such men as Chatham, Burke, Adam Smith, Grenville, Barnard and Pownell, in the eighteenth century, had dreamed of a parliamentary union between England and her plantations. Thomas Pownall,

who had been Governor and Commander-in-Chief of Massachusetts and South Carolina, had a prevision of a British Oceanic Commonwealth, based on equal partnership rather than on relations of dominion and dependence. A few years before the American rebellion, which revealed the contrary forces in operation and triumph, he had written :

> " It is the duty of those who govern us to carry forward this state of things . . . that Great Britain may be no more considered as the Kingdom of this Ile only, with many appendages of provinces, colonies, settlements, and other extraneous parts, but as a grand marine dominion consisting of our possessions in the Atlantic and in America united into one Empire, in a one centre where the government is. . . . The taking leading measures towards the forming of all those Atlantic and American possessions into one Empire of which Great Britain should be the commercial and political centre is the precise duty of the Government at this crisis. (Such a system) must build up this country to a degree of glory and prosperity beyond the example of any age that has yet passed."

But three thousand miles of " salt estranging sea " damped all such aspirations. " Perhaps," said Burke of the proposal for parliamentary representation in London of the British plantations, " I might be inclined to entertain some

such thought; but a great flood stops me in my course, *Opposuit Natura*. I cannot remove the eternal barriers of creation." Alluding to a supporter of the same notion, he exclaimed, "It costs him nothing to fight with Nature, and to conquer the order of Providence, which manifestly opposes itself to the possibility of such a parliamentary union." These words were uttered in 1769, and that, by a strange and striking coincidence, was the very year in which James Watt took out his patent for his first steam-engine—an invention destined in the course of time to take all the force and virtue out of the great orator's argument.

There was good reason for doubting the possibility of those early proposals. Burke estimated that an election writ would require six weeks to cross the Atlantic. The reader may compute how long it would have taken for the writ to go, the prospective New England or Virginian M.P. to be elected, and to arrive in the Parliament House at Westminster. At this day we can scarcely realise the remoteness of the British oversea dominions from our own shores before the modern developments of mechanical science. Sir George Grey, who made his first voyage to Australia in 1836, took about six months to arrive on the western shores of that country. Just as little can we realise the hardships of those interminable voyages in the ill-equipped sailing-vessels of those days. I am not sure that the prejudice which still surrounds the word "emigration,"

is not a reminiscence of those early experiences.

But it is important to remember that the foundations of the constitution and destiny of these British settlements were laid under these conditions of extreme remoteness. Distance having made it impossible to give the British settlers representation in the Imperial Parliament at Westminster, these states were necessarily endowed with self-governing institutions. These were given before the effect of modern improvements in locomotion had become effective. The first steamship, of a comparatively primitive type, from England to Australia, sailed in 1852. Direct telegraphic connection between England and Australia began in 1872, between England and New Zealand in 1876, and between England and South Africa in 1879. But the thrill of these newly-developed nerves of communication was scarcely appreciable before the eighties of last century. Then it was that steam and electricity began to influence the course of our Imperial history and politics. This was, no doubt, one of the many converging causes of that great outburst of "Imperialism," or the sense of Empire citizenship, which has been the most striking feature of British politics of the last half century. It was that decade which saw the creation of the Imperial Federation League (1884), the proud pageantry of the Jubilee, and the meetings of the first Colonial Conference (1887).

But before that time most of the British colonies in temperate climes had received self-governing and responsible constitutions on the home model. Canada received full self-government in 1840, becoming the Dominion in 1867. New Zealand got responsible government in 1852, New South Wales, Victoria, Tasmania, and South Australia in 1855-6, Cape Colony in 1872. No one will regret that the future Dominions should have made their first steps towards nationhood in these days of isolation. If the new era of swift and regular communications had preceded the birth of self-conscious statehood, the overshadowing and centralising influence of the home-country might have altered the whole course of colonial history, and not for the better.

The foundations of self-governing statehood having been thus truly laid, the new inventions came in good time to prevent the separating and disintegrating influences from going too far. The service we may ask of them is to promote by means of common counsels for common ends and by close sympathetic and continuous intercourse, a union based on a free partnership, and to foster the wider sense of Empire citizenship, which need conflict in no way with the more particular loyalty to State and Dominion.

These triumphs over space and time have as yet approached no finality. The developments of aviation and of wireless telegraphy and telephony in these last years, are far more

wonderful than the substitution of steam for sails and horses. We can only surmise how the political implications of these increasing wonders may work out. The results, as political writers have pointed out, may not altogether be to the advantage of the Empire. It may not be an unmixed blessing to bring even the British members of the Empire into closer and more continuous contact. Juxtaposition does not always mean agreement, and even relations may see too much of one another.

One effect of these changes must be to bring the great reserves of native population in the Tropics into nearer neighbourhood with settled white communities, and this has already engendered the most baffling problems in South Africa, British Columbia, Kenya, and other parts of the Empire. Free movement along these swift and regular lines of locomotion might seem to be among the common rights of Empire citizenship. Free movement and free settlement within the Empire's fences ought surely to be a British birthright. Every Briton, regardless of race and creed, ought to feel in a sense at home whether in Calcutta or Cape Town, in Sydney or Vancouver.

This, indeed, was the boast and the ideal of the old Roman Empire, with its infinitely slower and less convenient modes of travel. We are familiar with the much-cited words of the Roman poet Claudian, whose date was roughly A.D. 400, in his proud rhapsody on the power

and glory of Rome. "Hers," he writes, "is that large loyalty to which we owe it that the stranger walks in a strange land as if it were his own; that men can change their homes; that it is a holiday affair to visit Thule and to explore remote regions at which we should once have shuddered; that we drink at will the waters of the Rhone and Orontes; that we are all one people." "Everywhere," exclaims the Spanish priest, Orosius, a few years later, "everywhere is my fatherland, my law, and my religion."

This was a notable achievement, but Rome had no such Empire problem to face as confronts England in her 350 millions of subject races for whose welfare and government she is directly responsible. The march of mechanical science tends rather to accentuate than to ease this problem of the relations between the white and the coloured races.

We need not dwell on all the sacrifices we have to make in return for a great and undoubted blessing. But one more may be mentioned. The inventions which are bringing the constituent parts of the Empire closer together are also bringing the Empire and its parts nearer to the outside world. Foreign nations are developing their communications as well as the British. Let us take, for example,

[1] Hujus pacificis debemus moribus omnes
Quod veluti patriis regionibus utitur hospes:
Quod sedem mutare licet: quod cernere Thulen
Lusus, et horrendos quondam penetrare recessus:
Quod bibimus passim Rhodanum, potamus Orontem:
Quod cuncti gens una sumus.

the Panama Canal. That is an American enterprise. The banks of the waterway are virtually a part of the coastline of the United States. Yet this "severing of the waist of the world," cannot fail to have a profound effect on the internal economy and external relations of the British Empire.

The electric thrill of this new circuit through the Central American isthmus will be specially felt in British Columbia. Already the produce of western Canada, say, from a line drawn vertically a little west of Saskatoon, tends to flow through Vancouver, and to find its way round by the Panama Canal to the eastern American coast, and to England and Europe beyond. This quicker and cheaper transport should mean a bigger value for the wheat of the western prairies and for the fruit and timber of the Pacific province. If this movement establishes itself Vancouver bids fair to become one of the most important commercial *entrepôts* in the world.

Then the West Indies, which have lain hitherto in what the Americans call a "dead-end," will henceforth be thrown along and athwart the main ocean highways between East and West. Britain occupies a strong commercial and strategic position in the Caribbean Sea. Kingston, in Jamaica, lies close off the direct track from New York and the Eastern Canadian provinces, through the Windward Passage between Cuba and Haiti, to the Caribbean entrance of the canal. The Virgin

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TED STATES
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Nigeria
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Panama
Uganda
Kenya Colony
Gold Coast
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Islands, Barbados, and Trinidad, all British possessions, command the other routes from Colon to Liverpool, Southampton and the old world. Then, the great oil reservoirs of Trinidad are likely to become more and more valuable in this region of traffic convergence, as oil becomes more general as the fuel for maritime engines.

A new era will open before these oldest and most beautiful of British possessions, strung like a necklace of pearls round the Caribbean, the Mediterranean of the new world. The Panama Canal brings the islands some 2500 miles nearer Australia and New Zealand. They should thus develop those closer trade relations with Australasia, which they have already set up with Canada by reciprocal tariff arrangements.

But the most important effect of the canal for the British world is the change in comparative distance between England and Australia and New York and Australia. Henceforth, it will be New York, and not Liverpool, which lies nearer to Yokohama, Sydney and Melbourne. Sydney, formerly 1500 miles nearer Liverpool (via Suez) than New York (via the Cape of Good Hope), now becomes 2424 miles nearer New York (via Panama) than Liverpool (via Suez). Wellington, in New Zealand, formerly equidistant between the two great ports, is now brought 2739 miles nearer New York than it is to Liverpool.

It is true the Eastern seaboard of Canada

shares with New York this closer proximity to Australasian ports. But the general effect of this moving away, so to speak, of Australia and New Zealand from the United Kingdom, and their closer approximation to the great and growing branches of the Anglo-Saxon stock in America, is to locate the centre of gravity of the English-speaking races still more firmly and permanently in the new world. What influence this may have in the long run on the position of the British islands in the Empire, is an interesting but not very practical speculation.

It is surprising that so little space has been devoted in books upon the Empire to the political effects of these mechanical and scientific inventions. The scientist has done far more to determine the destinies of the British Commonwealth and to ensure its permanence than the politician or the statesman, who has often, indeed, done more harm than good.

The effect of these advances in applied science has not been confined to bridging ocean spaces and bringing the sea-sundered masses of British territory closer together. It has made possible great continental groupings and federations. But for the railway line from ocean to ocean, the maritime provinces of Canada would have lost touch with the far Pacific gateway. The federal Commonwealth of Australia, the Union of South Africa, the fusion of Northern and Southern Nigeria under a single administration have been due likewise

to the "shining parallels." The railway has, indeed, been a wonderful state-builder. We may say, roughly, that down to the middle of the last century, the British Empire was an affair mainly of islands and coast lines, and that it scarcely became continental or began to deal with its vast hinterlands, until the advent of steam and telegraph.

On the whole it cannot be questioned that for an Empire like the British, with its world-wide dispersion and its masses of territory in three continents, these modern developments in transport and communication have been, and will continue to be, an overwhelming advantage. Sir Charles Lucas has judicially summed up the whole case :

> "Every change in human relations has its bad as well as its good side, and it cannot seriously be doubted that the net result of the elimination of distance must be to promote harmony between Great Britain and the self-governing Dominions. Increased coming and going must mean better understanding ; the vacant spaces will be filled by British citizens less and less moulded by distance, and, therefore, not increasing, but diminishing the divergence ; while the dangers of proximity which arise from facilities for interference, are now practically non-existent as far as regards the self-governing Dominions, owing to the fact that distance has done its work in creating distinct peoples and

demonstrating the futility and unwisdom of one people interfering in the domestic concerns of another." [1]

It is for British statesmanship and all well-wishers of the British Commonwealth to help in the proper direction of these new and incalculable forces, so that they may contribute in the best possible way to the welfare and progress of the whole Empire.

[1] *Greater Rome and Greater Britain,* p. 43.

Arms of New South Wales.

CHAPTER II

RAILWAYS

The history of railway construction within the British Empire reads like a romance. The distinctive feature of our era, it has been said, is the big state or empire. These vast political organisations could never have arisen, or been held together, without the help of the rail and the steam-engine. On the North American continent settlement spread inland from the eastern coasts which were nearest Europe and the old civilisations. But east and west could never have joined hands without the railway. Before its arrival the journey across the North American continent, whether across the United States or along the Canadian track, was practically impossible. When the gold rush to the Far West set in during the fifties of last century it was found necessary to build a line across the narrowlands of Central America between the points now joined by the Panama Canal. It was by this circular route that the diggers made their way from Europe and the eastern coasts of Australia to California.

The most decisive date in the history of the United States is May 10, 1869, when the two railheads advancing from the Far East, and the Far West, met near the Great Salt Lake, at

a point still marked by a board inscribed with these words :

Last Spike
Completing First
Trans-continental Railroad
Driven at this Point
May 10, 1869.

The corresponding Canadian achievement arrived sixteen years later. British Columbia had, not unreasonably, made it a condition of her entrance into the federated Dominion that she should be linked by a railroad with the eastern provinces. It is worth remembering that Nova Scotia is farther from British Columbia than from Great Britain, and that the prairies and the great chain of the Rocky Mountains are a more formidable barrier than the waves of the North Atlantic. Such a trans-continental line was inevitable unless east and west were to lose touch.

All the same, the construction of such a line was a wonderful feat of far-sighted statesmanship. " I realise better than ever," said Lord Milner at Vancouver a few years ago, " how bold was the conception of those who first grasped the idea of moulding all Canada from Cape Breton to Vancouver into a great confederation. They were great political architects who leaped the intervening wilderness, as it then was, between Ontario and British Columbia."

The natural trend of mountain-chain and river in the North American continent is north and south. The Canadian-United States frontier, corresponding for the greater distance with the forty-ninth parallel of latitude, runs for nearly 3000 miles athwart this physical trend. The main instruments in establishing the east and west political connection were the railway and the tariff. Free trade running east and west with a tariff-wall between north and south, had its state-building effect, but the railway system, which, though there are now branch lines over the frontier, still runs mainly east and west, was the most powerful of all consolidating influences. The Dominion of Canada practically dates from the November day in 1885 on which Lord Strathcona drove in the last spike at Craigellachie.

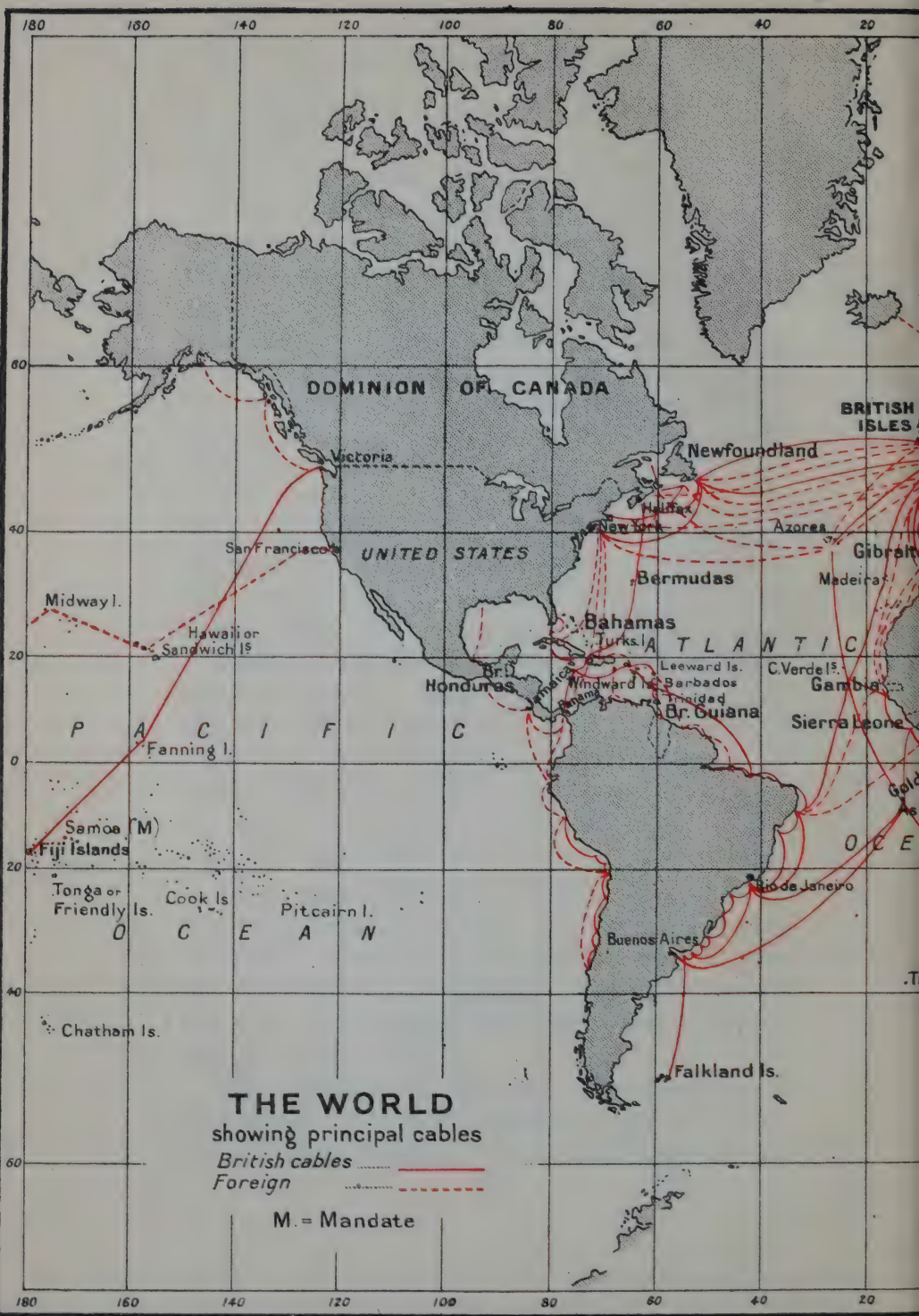
The next year (1886) witnessed some decisive and fateful events. On July 4, the first through train from Montreal reached Port Moody, then the Pacific terminus of the trans-continental railway. That train, when it drew up at the little station on Burrard Inlet, near Vancouver, after its long trail through the wilderness, had scored a big triumph for state-making as well as for mechanical science. And three weeks later arrived the good ship, *W. B. Flint*, which five weeks before had set sail from Yokohama, bringing a cargo of tea, the first merchandise to arrive for the new railway linking west and east. It is such events as these, and not the fall of Ministers or the death

of kings, that determine the destiny of nations.

The settler who saw the train from the east and the ship from the west arrive cannot have foreseen that in thirty years the Canadian Pacific Railway alone would be operating 19,000 miles of road, 16,000 in Canada and 3000 in the United States, and that the brig of 800 tons was the nucleus of a commercial fleet of 470,000 tons, holding high the British flag on Atlantic, Pacific, Mediterranean, Caribbean, and South China waters.

The railway development of Canada has been wonderful, always moving well in advance of population and economic need. The railway first arrived in the country in 1836, only a few years after the triumph of Stephenson's "Rocket," on the first Liverpool and Manchester railway. This earliest Canadian line ran between St. John's (Quebec) and Montreal, a journey of 16 miles, and was operated by horses, which gave way to the steam locomotive in 1837. But before 1850, the water routes were the main channels of communication and, as these were icebound for several months in the year, trade in winter was practically at a standstill. Canada could scarcely have begun her economic development, especially that of the vast and desolate but fertile west, without the aid of the railroad.

The opening of the first trans-continental line made a united Dominion possible, and gave a first stimulus to the development of



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the prairies. But Canada has breadth as well as length, and the construction of the Canadian Pacific Railway, mightily significant as it was, gave to Canada, as an economic unit, length, but it was length without breadth. It required two more trans-continental railroads, the Canadian Northern and the Grand Trunk Pacific, to broaden the advancing front of productive development.

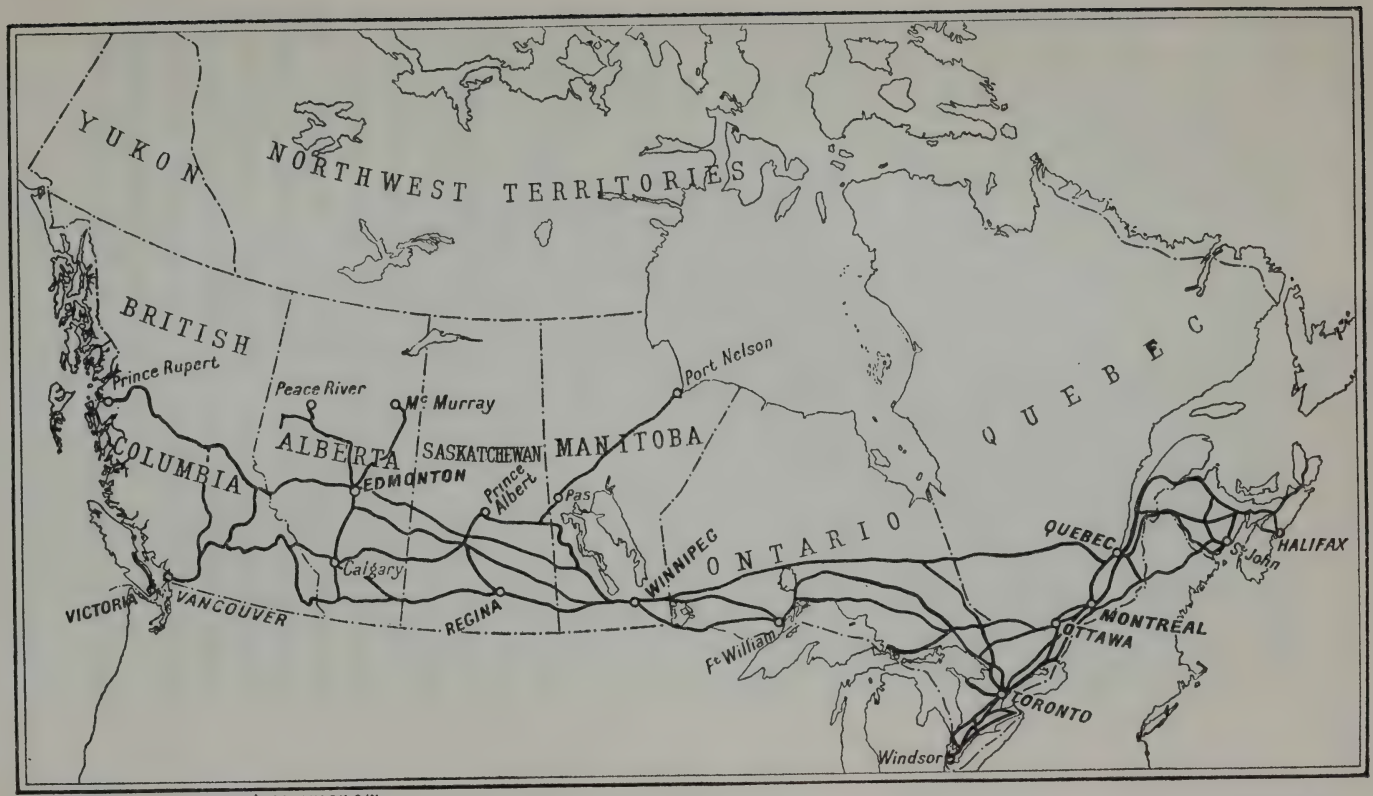
Canada has now two main railway systems, the Canadian Pacific, which still remains a privately owned and controlled enterprise, and the state railways, the Canadian Northern, the Grand Trunk, Grand Trunk Pacific, and the Inter-Colonial, all grouped together under the title of the Canadian National Railways. Taking into account the other lines owned by smaller corporations, the total Canadian mileage in 1919 was 38,896, of which 2543 miles were double track.

With new countries, such as Canada and Australia, questions of transport and communication are always in the political foreground, and Canada is contemplating and carrying out new enterprises. One of the most interesting is the new railway under construction, between Le Pas on the Canadian Northern Line and Port Nelson on Hudson Bay. It will be noticed that the main east and west lines of Canada all run south of the city of Winnipeg, which is only one hundred miles from the international frontier. If Canada's neighbour were any other than the United States, this

proximity of the main railways, which have been compared to the sections of a fishing-rod tied together at a centre corresponding with Winnipeg, would be a strategic danger.

Moreover, these lines are becoming less capable of dealing with the flood-tide of grain, which pours out of the prairies every harvest-time, and produces a "grain blockade" of increasing severity. To obtain a more northerly connection between east and west, and to ease in some degree these traffic congestions on the main lines, a railway is under construction between the points just mentioned. The route to the Atlantic via Hudson Strait is ice-free from July 20 to November 10, so that, as the margin of grain production advances northward, a substantial portion of each year's harvests could find an outlet along this channel. Moreover, in case of need, happily very remote, supplies of men and munitions could be sent along this route from east to west without fear of hostile interruption. The Le Pas-Port Nelson line is being constructed by the Dominion government.

During recent years railway construction has increased in cost and led to projects for the development of communication by water. The most important of these is the Georgian Bay —Montreal Canal, which would enable the prairie harvests to be shipped at the great lakes, and carried wholly by water to our English ports, instead of being largely diverted southwards to Chicago and other American emporia



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Canada's Railway System.

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and carried thence mainly via American railways to Boston, Portland and New York.

Turning to the continent of Africa, we have a no less romantic and enterprising record in railway construction. The railroad is letting the light into the Dark Continent with a vengeance. In the year 1876, there were only 400 miles of railway track in the whole of Africa. To-day there are more than 30,000 of fully constructed lines. All round the coast from a continuous succession of points the steel rails have pushed their way varying distances into the interior. Sometimes there has been a definite objective up country. For instance, in Nigeria, the farthest bend of the great river had to be reached, and the railway has now passed far beyond that region. In Kenya or British East Africa, the great lake Victoria Nyanza, 584 miles up country, beckoned the railway pioneers, and this space is now bridged by the Uganda line. Tanganyika, or German East Africa, provided the Germans with a similar goal in the great lake of that name, which is now connected by rail with Dar-es-Salaam. So also in South Africa, the golden city of Johannesburg has drawn up country the railway tracks from Lourenço Marques, Durban, Port Elizabeth, Cape Town, and far-away Cairo has attracted from Cape Town a track which has by this time penetrated to Bukama on the Congo, a good 2600 measured miles from Table Bay.

In spite of such achievements, much remains

to be done in the railway equipment of our African colonies. In the west our Gambia colony is still without railway and dependent for transport mainly on the Gambia River. In Sierra Leone, the main line runs from the fine harbour of Freetown to Pendembu, a distance of 227 miles, with a branch line from Boia Junction to Makene, another 83 miles, which latter is to be continued for another 30 miles to Baga. These lines are very important in view of the possible trans-Saharan development of which I shall shortly speak.[1]

Much has been accomplished also in the Gold Coast, where two lines, running into the interior from Sekondi and Accra on the coast, have now been joined up to form a sort of "inner circle" route. A short branch line runs also from the main railway to Prestea, the centre of a rich mining district. The gold and cocoa industries have been immensely advantaged by these railway lines.

But no railway construction in any tropical country has been so fruitful of political and industrial benefits as that which has been carried out in Nigeria. The main line which starts from Lagos, crosses the Niger at Baro and penetrates into Northern Nigeria as far as Kano, a distance of 706 miles, was officially opened in January, 1912, and the two Protectorates of Northern and Southern Nigeria were united under one administration in

[1] It is a pity that the authorities failed to realise this prospective importance of the lines and built them on a narrow 2 ft. 6 in. gauge and too lightly for heavy and increasing traffic.

January, 1914. This consolidation of what is a big tropical empire in itself could not have taken place without the railway line.

But the discovery of another good harbour along the Nigeria coast on the Bonny River farther east, now called Port Harcourt, secured another outlet for Nigerian products, and suggested another line into the interior from that point. This eastern line will run towards the other main line, reaching it at Kaduna, a distance of 500 miles. This railway opens up a region very richly mineralised, including the Udi coalfields, some 150 miles from Port Harcourt, which are believed to cover an area of 2000 square miles and constitute a most fortunate and valuable asset of the colony.

A very useful line also is the light railway from Zaria on the main line south-eastwards to the Bauchi tinfields, which was opened for traffic in 1913, reaching a point at Bukuru, 760 miles from Lagos—a journey that takes about forty hours.

The need and advantage of railway construction in a tropical dependency are best illustrated in the famous track in East Africa, called the Uganda Line, though it does not actually as yet touch the Uganda country. The Imperial British East Africa Company was no sooner incorporated (1888), than the need of a railway from the coast into the interior became insistent. Article 1 of the General Act of the Brussels Conference set out what the Powers declared to be " the most effective means for

counteracting the slave trade in the interior of Africa," the methods recommended including "the construction of roads, and in particular of railways . . . the establishment of steam-boats on the inland navigable waters, and the establishment of telegraph lines."

The British sphere of influence in East Africa as delimited by the Anglo-German agreement of July 1, 1900, definitely included Uganda, the vast and wealthy region 600 miles inland, north and west of the Victoria Nyanza, and the British Government, Lord Salisbury being Prime Minister, considered that its obligations under the Brussels Act could best be carried out in that part of Africa by building a railway from Mombasa to the Victoria Nyanza, with an accompanying telegraph line and a service of steam-boats on the great inland sea.

It is almost amusing nowadays to recall that the project was abandoned by the succeeding Liberal government, though the estimated cost of the proposed line was greatly less than the expenditure in a single day of the late European war. But the necessity for the line was too great and obvious to be resisted. Troubles arose with the natives in Uganda. By 1894, chartered company rule in East Africa and Uganda had become quite inadequate to the responsibilities involved. In 1894, a protectorate was proclaimed over Buganda, the central kingdom of the present Uganda Protectorate, and in 1895 the British Government took over the company's rights in East Africa,

for a payment of a quarter of a million pounds sterling, and a protectorate was established there also.

Lord Salisbury returned to power at this point, and the construction of the line was at once authorised. The base at Mombasa Island on the Indian Ocean was at once taken in hand and prepared, and platelaying began on the mainland on August 4, 1896. The mutiny of Sudanese troops in Uganda in (1897-99) and the Fashoda incident (1898), made it still more desirable to push forward the work as fast as possible. For these reasons the telegraph was carried into Uganda a long way ahead of the railway track.

The survey parties sent on ahead into the interior encountered manifold difficulties. The first two hundred miles were a jungle of dense thorn bush. Over this section also it was impossible to employ animals for transport, owing to the deadly tsetse fly. Bubonic plague in India impeded the recruiting of labourers there. In East Africa itself malarial fever was rampant. Man-eating lions established a reign of terror at Tsavo, a name made famous by Colonel Paterson's book. Some of the inland tribes gave trouble. Strikes at home in the engineering trades interfered with the delivery of rolling-stock, and then in the later stages came the Boer War to hamper and prolong operations.

Nevertheless railhead was persistently pushed forward. In 1900, it had crossed the Rift

valley to mile 476, nearly at the top of the Mau escarpment, and the far goal on the lake was reached before the end of 1901. The first locomotive to arrive on the shores of the Victoria Nyanza reached Kisumu on December 20, 1901, six years after the start of operations on Mombasa Island. The total expenditure on this invaluable line out of Parliamentary grants was £5,317,000, or rather more than £9000 per mile.

The Uganda railway was more than a convenience and an auxiliary to the British power. Without it British administration of these two big protectorates would have been impossible. Financially the railway began to pay sooner than had been expected. The industrial effects of the line have been as valuable as the political, and the Uganda railway was of the greatest service in the British operations against German East Africa in 1915 and 1916. A branch line, built during the war from Voi to Moschi, the northern terminus of the German Usambara railway to Tanga, effects a permanent junction between the British and German railway systems.

Besides this a branch has been run to the soda deposits around Lake Magadi, and another from Nairobi, the capital of Kenya to Thika, to be continued to Fort Hall and the Mount Kenya districts.

In Uganda itself a short (61 miles) but invaluable line, which has given a great impetus to cotton-growing in Central Africa, has

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Railways of Africa.

been laid from Namasagali, on Lake Kioga, a little below Kikindu, along the right bank of the river Nile, to Jinja. This is known as the Busoga railway. Linked with a line of steamers across the Victoria Nyanza, it effects a direct communication between Uganda and the Indian Ocean. But the actual or potential resources of Uganda justify a much bigger railway development. A very brief line constructed from Port Bell, the harbour of Kampala, to Kampala, 5.72 miles long, promises important extensions. Other projects are also on foot. A correspondent of *The Times* announced from Nairobi on November 3, 1923, that an important extension of the Uganda railway is proposed. A railway runs from Nakuru, over the Uasin-Gishu plateau towards the Uganda border. Railhead of this line is at Turbo. The Kenya government is anxious to continue the Uasin Gishu line from its present railhead at Turbo to the Uganda frontier, a distance of seventy-five miles, at a cost, approximately, of £500,000. The Uganda government is equally desirous of completing the proposed extension by constructing a line from its border to Jinja (which is situated on the Nile at the point where it issues from Victoria Nyanza). The benefits which would be derived from the building of the new line are great. It would give a direct rail route between Uganda and Mombasa, and also open up undeveloped cotton fields and native reserves.

When this Uasin Gishu entension is thus completed, there will be a real Uganda railway traversing Kenya colony, and entering far into Uganda to a terminus at Jinja, the main stations being Mombasa, Nairobi, Nakuru, Eldoret, Turbo and Jinja. "It may be stated confidently," wrote a correspondent of *The Times*, "that before the expiry of the two years during which the Uasin Gishu line will be building, plans will be formulated for the bridging of the Nile, and for the railway to be continued in a south-westerly direction to the Sudan border—the last section possibly electrified from the vast resources of the Ripon Falls, which are just above Jinja."

The Uganda line will in time throw out other branches into the country it traverses. One to Nyeri, which has a local importance, is to be undertaken at once.

Coming farther towards the coast section of the Uganda line it should be noticed that a line runs from the station Voi across the Kenya-Tanganyika border to Kahe on the German line, which runs up-country from the coast at Tanga as far as Moshi. This cross-country line was built, as already remarked, during the war, for the purposes of our campaign in the Kilimanjaro region against von Lettow-Vorbeck, commander in German East Africa. As a military line it was held after the war by the military authorities, who proposed eventually to scrap it. Great opposition was made to this intention, as the line has a considerable

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Railway Development in Uganda.

commercial value, the best outlet for the produce of the Moshi area being through Kilindidi port on Mombasa island. Much satisfaction has been caused by the announcement that the Kenya government will take over this Voi-Taveta-Kahe line.

Sir Horace Byatt, governor of the Tanganyika territory, has also announced that the Tanga-Moshi railway is to be still farther extended to Arusha, as far as the Sanga river, and that the Lindi light railway down in the south of the Territory, which serves a rich plantation area is to be extended. Some day this line may reach Lake Nyasa.

Here it is necessary only to mention the old German railway from Dar-es-Salaam through the colony to the neighbourhood of Ujiji, of Stanley-Livingstone fame, on the Lake Tanganyika. This line bears many resemblances to our Uganda railway. It may also be mentioned that a scheme is on foot for extensive improvements in the harbour equipment of Dar-es-Salaam.

The Anglo-Egyptian Sudan, covering an area of nearly a million square miles, is not as yet adequately provided with railways. But great progress has been made during the brief period since the country was rescued from chaos and oppression. It has already about 1500 miles of railroad track. The main line, due originally to purposes of war, extends southwards from Wadi Halfa, the frontier town between Egypt and the Sudan, to Sennar,

far south of Khartoum. From Abu Hamed a valuable branch extends south-westwards to Kareima, and from Sennar a still more significant line runs westwards to El Obeid in Kordofan, and will one day be continued to El Fasher in the Province of Darfur. Of this line I shall shortly have to speak again.

Eastwards from the main line, from Atbara Junction on the Nile, a railway runs to the Red Sea, which it meets at Port Sudan and Suakin. From this branch at Thamian it is intended to build a line to Kassala, to join up ultimately with the main line at Sennar, serving thus a wide circle of country. Other proposed lines, which but for the European war might have been completed, will run from Sennar to the very rich country of Singa, along the Blue Nile, farther to the south, and from Tokhar to Suakin.

Here again the railway, besides its incalculable economic influence, has been the chief agency in securing to the country permanent order and steady progress. And these railways, down to 1913, had cost in all less than seven million pounds sterling. We may calculate what even a hundredth part of the sums spent on a destructive world-war would have meant to the Empire, if expended on modern means of transport.

CHAPTER III

RAILWAYS—*continued*

During all these recent eventful years, Cecil Rhodes's dream of a continuous line through the entire length of the continent, the grand Cape to Cairo scheme, has been quietly working towards its fulfilment. This line, which links the Lion's Head with the Pyramids, the new world of the south with the hoary civilisation of the north, starts from Cape Town, runs steadily northwards to the Zambesi, which it crosses at the Victoria Falls. Then through Northern Rhodesia to the Congo frontier, and far over the border, through the richly mineralised Katanga Province, past Kambove and Tshilongo, to railhead at, or perhaps now a little beyond Bukama, that is, some 2600 miles from Table Bay.

Bukama is on the Congo, where that river, two thousand miles from its mouth, is already a navigable waterway. Hence we can travel by a steamer service operated by the Chemins de Fer des Grands Lacs, northwards along this great river of savageland, to Stanleyville, 600 miles down-stream. We cannot quite sail all the way, as rapids interrupt along two rather lengthy reaches, which are traversed by railways of corresponding length.

From Stanleyville the line will one day be carried through the remaining big gap, 548 miles long, in the very heart and centre of the dark continent, to Mahagi on Lake Albert. At Mahagi we find a steamer of the Uganda government, and embark for an entrancing journey through the lake and down the Nile, which carries us almost without interruption to the southern terminus of the Sudan main line from Wadi Halfa, whence we run quickly and comfortably northwards to Cairo. There is one difficult piece of navigation between Dufile and Rejaf, which may one day be overcome by means of a lock. It will be seen, therefore, that the north and south inland connection by rail and water is now practically complete, save for the 550 miles of "foot-slogging" still necessary between the Congo River and Lake Albert.

Meanwhile the east and west connection has been gradually materialising; starting from Dar-es-Salaam, the port and capital of the one-time German East Africa, we reach Kigoma, near Ujiji, a name familiar in stories of African exploration, on Lake Tanganyika. Having crossed the lake to Albertville, we reach the Cape to Cairo line at Kabalo on the Congo, whence we sail and train, as described above, to Stanley-ville. Continuing downstream, we reach at length, one thousand miles further down, Leopoldville, to which point vessels of 500 tons can descend. Two hundred and forty-

seven miles by train bring us to Matadi on the Congo, accessible to ocean-going steamers. The distance across this thick section of the African leg of mutton, from Dar-es-Salaam to Matadi, is rather over three thousand miles, and in the way and by the means described can be traversed in about forty days. The journey from Cape Town to the mouth of the Congo, which likewise can be accomplished without any tramping or portages or fatigue, is 4846 miles long.

The utility of the Cape to Cairo line consists not in simply linking north and south, but in lateral development east and west. From this central spine of African communication nerves and arteries are already forming on either side. Railways based on the coast are creeping up country with a view to ultimate contact with the main vertebra running north and south. On the east the lines from Mombasa and Dar-es-Salaam to the great inland lakes will, as we have seen, link up with the north and south line.

From the western coast three important lines run up country from Benguela, Loanda, and Mossamedes, in Portuguese Angola. These are not lines through British territory, but the Benguela Railway Company is largely financed by British capital. That line starts from Lobito Bay, perhaps the finest harbour on the entire African coast, 4930 miles from Southampton. It has penetrated into the interior as far as Belmonte, 390 miles from Lobito

on a high table-land 5000 feet above sea-level, and has already opened up a very rich tract of country, and covered its working expenses. Its great value consists on its comparative neighbourhood to Kambove, the Katanga mining centre on the Cape to Cairo railway, and the rich copper deposits in that region which seems destined to be the central ganglion of African trade and traffic.

To appreciate the importance of this Benguela line it should be noted that the distance to Kambove via Beira and Bulawayo is 9514 miles, via Dar-es-Salaam 8937, via Cape Town 8481, and via Lobito Bay only 6457 miles. Owing to the excellence of the harbour, and this closer distance to Kambove and the central line, Lobito Bay, as Mr. Evans Lewin has truly said, is destined to become one of the most important seaports in Africa.

Of the other two lines in Portuguese Angola that from Mossamedes will probably in time join up with the Cape to Cairo railway at Livingstone, near the Victoria Falls, and also with lines constructed in the northern parts of the old German "South-West," which possesses no port north of Swakopmund and Walfish Bay. This latter project was contemplated before the war by a powerful German syndicate and might well be adopted by the government of the Union of South Africa.

The line from Mossamedes runs at present

as far as the Chela mountains (105 miles), while the Loanda railway reaches railhead at Malange, 312 miles inland, and may soon continue its advance to the Lunda district, when political conditions allow.

We need not dwell on the extensive and ever-extending railway system of South Africa, or with the developments along the coast of Portuguese Mozambique, at Delagoa Bay, Inhambane, Beira, Quilimane, and Mozambique, whence prepared or preparing lines connect the ocean with the Transvaal, Southern Rhodesia, Nyasaland and North-Eastern Rhodesia. Here many developments are in prospect. The war interfered with the building of a railway from Beira to the Zambesi which, however, has now been completed, and a line to Nyasaland has already made a start from Mozambique and is destined to open a very fertile country. The same cause has delayed the extension of the Central African and Shiré Highlands Railways (from Chindio on the Zambesi to Port Herald in Nyasaland), northwards to Lake Nyasa, for which financial arrangements were made in 1914. This last line, by providing an outlet for the lake-traffic and reaching up into North-Eastern Rhodesia, will be of great economic value.

But in dealing with the African railways, we have not yet mentioned a project which may revolutionise the whole aspect of the continent and of its external relations, may

compete effectually with the Cape to Cairo route, and render England and the nations of Europe independent in time of war, and even for peaceful purposes, of the Suez Canal. I mean the grandiose, but by no means impracticable scheme of continuing the railway lines running south from French Mediterranean ports in Tunisia, Algeria and Morocco, right across the Sahara to Lake Tchad and the heart of the African continent. This scheme has been debated and contemplated in France ever since 1830, and thirty or forty years ago, preliminary surveys were made. The engineering difficulties of railway building across that vast wilderness are not at all insuperable. The difficulty has been the attitude of the Saharan and Sudanese tribes *en route*, which is now and will probably continue to be less hostile.

A glance at the accompanying railway map will at once show the nature and main purpose of this enterprise, which, tremendous as it is, will one day be accomplished. Mr. Evans Lewin has carefully set out the main features of the prospective trans-Saharan railway system.[1] The reader will easily follow the lines in the map.

> "That railway system consists of two portions, each of which is to fulfil a distinct function in the economic regeneration of

[1] See his "Railways in Africa," in *United Empire*, Jan., Feb., March, 1917.

Africa. The first is to develop the economic resources of the Congo regions and more especially the northern portions of the Belgian Congo, and the Chari-Chad-Ubangi districts, and to provide a rapid means of transit between France and the somewhat inaccessible territories of French Equatorial Africa. Two main routes have recently been suggested for this purpose, both starting from settlement on the Ubangi River, the northern tributary of the Congo and proceeding towards the neighbourhood of Lake Tchad, whence they are to be continued to one of the Mediterranean ports. The first of these routes starts from Zemio, skirts the northern shores of Lake Tchad, proceeds through the Hoggar district of the Sahara, and thence takes a sharp bend to the west, enters Algeria in the neighbourhood of the Moroccan frontiers, and finally finds its natural outlet at the ports of Oran and Algiers. It is proposed that this system should be connected with the Nigerian railways by a line constructed from Kano, the present railhead in Northern Nigeria, through Zinder, in French territory, to some point on the proposed line. The second, the more direct easterly route, starts from Fort de Possel, skirts the eastern shores of Lake Tchad, and then proceeds to the eastwards of the Hoggar district, whence it continues due north to join the Algerian and Tunisian systems and finds its natural outlets on

the Mediterranean at Algiers, Philippeville, Bizerta and Tunis." [1]

The first great functions of the trans-Sahara system, then, will be to open up the vast resources of the Belgian Congo and provide direct communication with French Equatorial Africa ; to link up with the great railway centre in Katanga ; to send out branches in order to establish connection with the British railways farther west in Nigeria, the Gold Coast, and Sierra Leone, and with the lines in Guinea and other French colonies. This means an enormous extension of trade and development in the hinterland of these African colonies along the coast, and should inaugurate for them a new era of prosperity.

But this system would have a still wider world-effect. It would provide by far the quickest route between England, and Europe in general, to South America. The journey from England to Valparaiso involved until recently a long voyage across the "summer of the world," and round the stormy and inhospitable Cape Horn. The new route via the Panama Canal has shortened the sea-voyage in

[1] Since the above was written, however, there have been important developments in France in connection with the proposed trans-Saharan, but the scheme outlined suggests some of the possible divergences from the main route. The Paris-Lyon-Méditerranée Railway Company has notified its willingness to become the concessionaire of such a line, and the route selected by the French government will commence at Oran on the Mediterranean and pass through Colomb-Bechar, Beni-Abbes, Adrar, and Taurirt to Tossaye, where it will cross the Niger. Thence the line will be continued to Wagadugu, an important economic and strategic centre within the great bend of the Niger. This line will be about 2000 miles long, and is estimated to cost about £17,000,000.

some measure, but let us observe what the route is likely to be in the future. Starting from London we shall travel through Spain or France to some port on the southern Mediterranean, from which a trans-Saharan line will strike south-westwards and convey us to the French port of Konakry or the British port of Freetown (Sierra Leone), on the West African coast. Then comes the oceanic stage, which we cannot avoid, but we cross the Atlantic at its narrowest breadth between West Africa and the most easterly point of Brazil. People who look at the world on Mercator projections rather than globes do not realise how nearly these opposite shores of the old and the new world approach each other. I believe the distance is about 1700 miles. The most easterly port is Natal, where we should land and, thence, when the projected railway line is ready, speed southwards along the east coast of Brazil, to the town of Victoria, which is now connected by rail with Buenos Aires. From this city we mount the new and wonderful trans-Andine railway and reach Valparaiso on the western coast in two days; thus saving ten days' journey upon the old sea-route, round the Horn or via the Magellan straits, between the two South American capitals.

It is almost unbelievable that this route I have thus sketched, would reduce the sea-passage between London and Buenos Aires by 4,300 miles. The saving of time between Europe or England and South America, when

the lines are completed and the route is fully organised, would be immense.[1]

Not long ago I heard Mr. Robert Williams, a great South African railway pioneer, say : " given the Channel Tunnel, and a train ferry across the Bosporus, one may certainly look forward at no distant date to taking a through train at Victoria Station for Cape Town." This route would run through Constantinople, Anatolia, and Palestine, enter Egypt over the Suez Canal, and thus join the Cape to Cairo line southwards.

But one of these trans-Saharan projects would quickly supersede that as the quickest way to South Africa. It is suggested that a line might run from Bizerta (in easy reach of Marseilles and Genoa) southwards through Ghadames and Ghat, visible in the map, to Lake Tchad, and that from there branching lines should be constructed to the Congo in the south, and to Uganda in the south-east, together with another to meet the line which now runs from Sennar, south of Khartoum, on the Cape to Cairo line, westwards to El Obeid, but will one day, as already said, be completed to El Fasher, the capital of Darfur. The supreme importance of this new route is that it would turn the flank of the more easterly Cape to Cairo line, and would make England and France far less dependent on the Suez Canal, by bringing the Northern African coast, at a point far to the

[1] The French are organising an aeroplane service along this route connecting Paris with Buenos Aires, a distance of 7000 miles.

west of Egypt, into direct communication with Mombasa, Port Sudan, and in turn with the starting point of the Abyssinian railway on the Red Sea, Jibonti.

It is not probable that a trans-Saharan line or lines running southwards from the Mediterranean to the heart of Africa would divert much of the heavy traffic of these central regions from the railways running to the nearer coast lines west, east and south, but for passengers and mails the lines might easily compete in point of quickness and directness with the main Cape to Cairo route. It is estimated that the trans-Saharan line would enable travellers to travel from Paris to the French Congo in four days, from Brussels to the Belgian Congo in five days, from London to the Transvaal in six days, and to Australia in three weeks.

Let us now turn to Australia. Here, as elsewhere, the history of railway construction almost coincides with the general economic history of the Commonwealth. With the exception of a few colliery and other lines, the Australian railways are publicly owned and controlled, either by the Commonwealth or by the individual states. The proportion of Commonwealth to State lines is about as one to twenty. Speaking broadly, the railways occupy the coastal areas, the centre of the continent being as yet without railway facilities. The railway arrived in Australia in the year 1854, the progress since which date may be recorded in the following instructive table :

Government and Private Railways.—Mileage Open, 1855 to 1921.

Year	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Federal Territory	Northern Territory	Commonwealth
	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles
1855	14	2½	....	6¾*a*	....	....	....	....	23¼
1861	73	114	....	56	....	....	....	....	243
1871	358	276	218	133	12	45	....	....	1,042
1881	1,040	1,247	800	845	92	168	....	....	4,192
1890-1	2,263	2,763	2,205	1,666	656*b*	425*b*	....	145	10,123
1900-1	2,926	3,238	2,904	1,736	1,984	618*c*	....	145	13,551
1910-11	4,027	3,574	4,390	1,993	3,208	675	....	145	18,012
1914-15	4,439	3,936½	5,449¼	2,955	4,553	779½	5	146	22,263¼
1915-16	4,491¾	4,152½	6,452½	3,060¼	4,707½	758¼	5	146	23,773¾
1916-17	4,781¾	4,176½	6,702¼	3,241¾	4,878½	783¾	5	199½	24,769
1917-18	5,025	4,222¾	6,769½	3,356½	4,904¼	781¾	5	199½	25,264¼
1918-19	5,170	4,260½	6,841½	3,404	4,965½	811	5	199½	25,657
1919-20	5,377	4,284½	6,946¾	3,458¼	4,846	840¼	5	198¾	25,956½
1920-21	5,402	4,337½	7,012¾	3,463½	4,906	877	5	198¾	26,202

(*a*) The line between Goolwa and Port Elliot was opened in 1854 as a horse tramway, but now forms part of the railway sytem. (*b*) To the 31st December, 1891. (*c*) To the 31st December, 1901.

It will be seen that Queensland, the tropical and sub-tropical state, has by far the largest mileage. She has built persistently into the interior from such littoral points as Rockhampton, Townsville, and Cairns, and she will shortly complete the north and south connection between Brisbane and the last-named port.

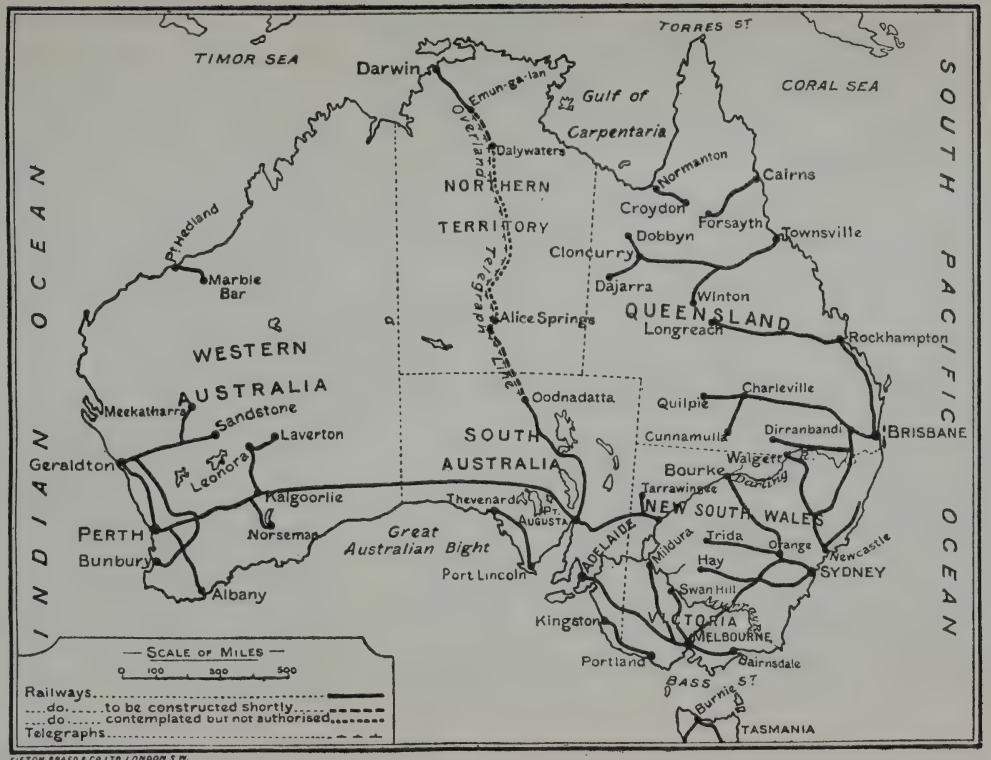
In the eastern, south-eastern, and southern parts of Australia, there is now a fairly dense network of railways, converging from the various agricultural, pastoral, and mining districts towards the principal ports which are themselves connected *inter se* by lines running approximately parallel to the coast. In the east, lines radiating from Cairns, Townsville, Rockhampton, Brisbane, and Sydney, run up-country to distances as great as 600 miles. Similar lines in the south-east converge towards Melbourne and Sydney. In the south four main lines, with many branches, run from Melbourne, while from Adelaide one main line, with several branches to the coastal towns, runs northwards for nearly 700 miles to the point which may one day be linked up with the Northern Territory line running south from Port Darwin to Katherine River. Another railway runs south-eastwards to various ports, meeting the main line from Melbourne on the South Australian-Victorian border near Serviceton. Melbourne and Adelaide are wedded by a through line of the 5 ft. 3 in. gauge throughout.

By the opening of the Hawkesbury Bridge

in 1889, railway communication was established with a break of gauge between Queensland and New South Wales. A bridge over the Murray River had similarly linked Sydney and Melbourne in 1883. Thus Brisbane, Sydney, Melbourne and Adelaide were connected, but there were still the two great continental gaps between north and south, from Katherine River to Oodnadatta and between west and east, from Kalgoorlie to Port Augusta (S. Australia).

It is curious that these two unbridged gulfs were almost precisely of the same length, that is, a little over a thousand miles. The west and east railway connection, so essential to the effective inclusion of Western Australia in the federation, is now completed. It runs through a weird and lonely land, which was once a sea-bottom, and includes in its track a stretch of three hundred miles which is the longest absolutely straight section of railway line in the world. The singular nature of the country it traverses may be gathered from the absence of a single permanent stream of water along the entire thousand-mile course. A Western Australian member of the Commonwealth Parliament can now reach Melbourne without facing the discomforts of a long and stormy sea-passage round Cape Leeuwin.

North and south have not yet joined hands. At the beginning of 1911, that vast empty region of half a million square miles, known as the Northern Territory, full of mineral and



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Australian Railways.

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vegetable wealth, was transferred from South Australia to the Commonwealth government. Under the "Northern Territory Acceptance Act," the Commonwealth purchased the Port Augusta to Oodnadatta Railway, and agreed to complete the construction of the railway from Port Darwin to Port Augusta. This undertaking remains unfulfilled and it is possible that the north to south line may be preceded, though not necessarily superseded, by a line running south-east from Katherine River and joining up with the Queensland railways, which have penetrated hundreds of miles into the interior from various points along the coast.

To indicate the possible effects of such a development as this line from Darwin to Adelaide, I may quote a letter read at a meeting of the Royal Colonial Institute in 1919,[1] from Dr. G. E. Morrison, Political Adviser to the President of the Chinese Republic. He wrote:

> "I hope the day will come when the trans-continental railway in Australia, from Adelaide to Darwin, will be completed, and that I may live to travel by it. Such a railway would bring Adelaide, in the south of Australia, within twelve days of Peking, in the north of China, and as in normal times Peking is within twelve days of London, and may be brought within ten days when

[1] The occasion was a lecture by Mr. T. R. Johnson on "Railway Development in Australia," reported in *United Empire*, September, 1919.

the Siberian railway is reorganised, and again open, it is not inconceivable that within measurable time letters from London will be sent to Australia via Siberia. At present the railway is open from Peking to Hankow, and the railway from Hankow to Hong-Kong is under construction, work having been interrupted by the war. When the work is completed, I see no reason why Hong-Kong should not be brought within three days of Peking, and Hong-Kong—with an efficient service of mail steamers—brought within five days of Darwin. Such improvement of communication opens up infinite possibilities of trade development between Australia and the thickly populated regions of Eastern Asia."

Australia, I suppose, provides longer stretches of through railway travel than any country in the world. The main interstate line, which permits of direct communication between the five capital cities, Brisbane, Sydney, Melbourne, Adelaide and Perth, covers a distance, from end to end, of 3475 miles, or 3480 miles via Newcastle. The journey from Brisbane to Perth is scheduled at six days, one hour, forty-two minutes, and from Perth to Brisbane, at five days, twenty-one hours, forty minutes. The longest journey which can be undertaken in Australia, on one continuous line of railway, is from Longreach in Queensland, to Meekatherra in Western Australia—4760.31 miles.[1]

[1] See the map of Australia.

The Australian railway system awaits one essential and rather belated reform—the unification of the gauges, which differ widely among the states. In New South Wales the gauge of the track is 4 ft. 8 in., in Victoria 5 ft. 3 in., in Queensland 3 ft. 6 in., and so on. A short-sighted economy was the chief reason for this state of things. It is a thousand pities Australia failed to adopt everywhere the policy recommended as early as 1846, by Mr. Gladstone, then Colonial Secretary, who suggested to the governor of New South Wales a 4 ft. $8\frac{1}{2}$ in. gauge. The variations in gauge, by making transhipments of passengers and goods necessary at the State boundaries, militates against the efficiency of the whole railway system. Before the State railway systems were linked up at the common boundaries, this inconvenience was naturally not felt, but in these days of continental inter-communication, the delay and trouble and expense of these interruptions are incalculable. From a political point of view, also, the reform is imperative, in order to cultivate the wider national sentiment as distinct from the sometimes too narrow particularism of the individual States.

In 1921, the Governor-General appointed a Royal Commission, consisting of two railway engineers—one civil and one mechanical—together with an independent commissioner to inquire into and report on the question of the unification of gauges. The result of the commission's work was a recommendation

that the gauge of 4 ft. 8½ in. be adopted as the standard for Australia ; that no mechanical, third rail, or other device would meet the situation, and that uniformity could be secured by one means only, viz., by conversion of the gauges other than 4 ft. 8½ in.

The matter was discussed at a Conference of the Prime Minister with the Premiers in Melbourne, when it was decided to adopt 4 ft. 8½ in. as the standard gauge for Australia. At this Conference it was also resolved that the adoption of a uniform gauge is essential to the development and safety of the Commonwealth.

The scheme advocated by the Royal Commission as the first step will provide a standard 4 ft. 8½ in. gauge railway between Brisbane and Fremantle, and the conversion of the whole of the broad-gauge lines of Victoria and South Australia, at an estimated cost of £21,600,000, spread over a period of approximately eight years.

Much might be said about railway-making in New Zealand, where the engineer was faced with physical difficulties of an exceptional kind. Whenever the engineer attempted to leave the coast on either side of the islands, he was met by mountain barriers, which opposed almost baffling obstacles to the advance of the metals. A striking feature of the New Zealand railway system is the number of bridges, spanning innumerable chasms and gorges and implying an enormous expense. The decisive achievement in railway-building, in this England of

the far south, was the trunk-line between Wellington and Auckland, a distance of only 450 miles, but conditioned by every difficulty, physical, mechanical and financial, that could stand in the path of the railway pioneer. The North Island Trunk railway stands to-day as a monument of that pluck and determination which have marked the whole story of our Empire railways.

India contributes another romantic chapter to the history of those railways. Here too a conspicuous feature are the bridges thrown across the wide Indian rivers, with their tortuous courses and liability to overflow their banks. Here are some of the most spectacular bridges in the world, for example, the Curzon railway bridge over the Ganges at Hyderabad, and, in North Burma, the wonderful viaduct which carries the metre-gauge single track of the Burma railway company over the Gokteik gorge. No agency in India has done more than the railway to stimulate a corporate sentiment and the beginnings of a real Indian public opinion in a country containing an almost countless variety of races and religions and a Babel of 147 distinct languages. This effect is unfortunately hampered in India, as in Australia and West Africa, by the many variations in gauge throughout the country.

The Indian railways may be destined to play a still bigger part in the ever-developing system of world-communications. It will not be long before these lines are continued through

Burma to Mandalay. In the Malayan peninsula railway construction has been going on steadily these late years, and Johore Bahru, at the extreme end of the mainland, is now linked with Bangkok. When the Indian railway system is joined with these Burmese and Malayan lines and throws a line out westward through Baluchistan to meet the railway from Baghdad, it will then be possible, given a tunnel or train-ferry at Dover, and a ferry at the Bosporus, to take a seat in a railway carriage at Victoria Station and sit in it right away to Singapore.

Everybody must have marked the existing tendency to substitute land for sea routes. The world is getting either more prone to seasickness, or more impatient of the slow speed of even the fastest ocean-going vessels. The oceanic age which succeeded an earlier terrestrial or Mediterranean, and in which England built up her great power and prosperity, seems to be giving way in turn to another land epoch, over a much larger area. How far these long new railway routes may themselves be affected by the prospective lines of air-traffic is hard as yet to determine.

Some instances of the organisation of immensely long railway routes have already been mentioned. I need only refer to the Russo-Siberian railway, which links London by an almost continuous land-route to the Far East. In fact, the whole breadth of the European and Asiatic continents, including Australia,

will soon be traversable by lines of communication in which only the gap between the nearest railhead in Asia and the nearest in Australia, will be water. It may be news to some persons that only about 300 miles divide the Australian coast from the nearest point in the Dutch East India islands to the west.

Some day perhaps even the straits of Alaska will be tunnelled or ferry-bridged, when it will be possible to travel from England to Vancouver, or Valparaiso or Buenos Aires, almost without seeing salt water at all.

Despite all possible developments of other forms of transport, there is still a great need for more railway construction in the Empire. Lines running up country in British Guiana, lines in Uganda developing great cotton-lands, lines in the Sudan, more lines in Kenya and Tanganyika, lines through vast Australasian and Canadian solitudes, are all urgently needed, and with the return of prosperity and normal conditions will have to be taken in hand.

CHAPTER IV

SEA AND AIR

In an Empire of dispersion like the British, sea-communications have hitherto been of paramount importance, and no developments of locomotion by other media are likely to abrogate that principle, and to do away with the necessity of maintaining British sea-power. It was sea-power that created the British Empire and it is only by maintaining sea-power and the communications based upon it that an Oceanic Commonwealth like the British can continue to exist.

Though we have fairly kept the "watery ways" open in the past, for our liners and merchant ships and men-of-war, I fear there has been a good deal of *laissez faire* in our sea policy in time of peace. To take, for example, the subject of mail contracts. There has been little care or effort to make these serve the highest commercial and political interests of the Empire. We have organised certain sea-routes and stereotyped them with quite needless rigidity. For instance, we inclined to the view that the only practicable mail-route from England to Australia and New Zealand, was via France, Brindisi, and the Suez Canal. That is not an all-British route and is not the

safest from a military point of view. The depth of the Suez Canal limits the draught of vessels that can be employed on this track. Moreover, this route serves least of all to develop intercourse among the diverse regions of the Empire. On this particular question of the Brindisi route Sir Laming Worthington-Evans said at the Imperial Economic Conference (October 16, 1923):

"I have been recently urged from several quarters, not least by the Italian government, that mails for India and Australia should be embarked at an Italian port, either Brindisi or Taranto, as they were before the war, and it is represented that a considerable acceleration could thereby be secured.

"I have examined this possibility very carefully, but I have come to the conclusion that the advantage, if any, and it is very doubtful if there would be any acceleration at all, would certainly not be sufficient to compensate for the very heavy additional cost.

"It is true that the transit time of the Indian mail is now about 24 hours longer than it was before the war, when the mail was embarked at Brindisi. Of this 24 hours, not more than half can be attributed to the shortening of the sea passage by carrying the mail through Italy. The remaining 12 hours were due to the small boats which carried the mail from Brindisi to Port Said, where it was transferred to the P. and O.

mail ship, being considerably faster than the mail ships themselves. These shuttle-boats have now been sold out of the service, and the cost of replacing them and restoring the Brindisi-Port Said service would be extremely heavy, and would ultimately entail an addition to the P. and O. contract payments.

"Apart from this, the Italian railways are not notable for their punctuality, and it is very questionable whether they could maintain the pre-war timing. The cost of the overland transit through Italy would be between £60,000 and £70,000 per annum. The rather problematical saving of about twelve hours would land the mail at Bombay in the evening or at night and would have little or no effect in accelerating its delivery. I am satisfied, therefore, that the extra cost, which, as I have said, both for the land transit and the additional sea service, would be extremely heavy, would not be warranted."

It is very important that alternative routes should be devised for mail conveyance between England and "down under," routes which should be equally speedy and convenient and should also serve the object of developing exchange of trade and other intercourse among the widely dispersed parts of the Empire. There is no reason to abolish the service via France and Italy, but it might be alternated or supplemented by other routes via Western Canada and the Pacific, via the Union of South

Africa, and via Halifax, Bermuda, Jamaica, the Panama Canal and Tahiti.

We get a perverted idea of comparative geographical distance owing to the use of flat maps and Mercator projections, instead of globes. Many people would be surprised to hear that the distance between England and Colon (the Caribbean terminal of the Panama Canal) via Jamaica, is only 400 miles less than via Halifax, in Eastern Canada, and Bermuda. The sea communications between England and Australasia badly require to be speeded up. The Brindisi-Suez route to New Zealand is not even the shortest. It is 560 miles longer than the route to Auckland via Atlantic, Panama Canal, and Pacific. To Australia the Brindisi route may be shortest in point of distance, but in point of time it is probable that as fast a transit could be obtained by one of the alternative routes which afford facilities for larger vessels and consequently for a higher speed. There is already a monthly trans-Pacific service via San Francisco, which carries the mails between the United Kingdom and Sydney in thirty days—as short a time as that required on the route via Brindisi, Suez and Melbourne.

Despite the experience of submarine warfare in the world-war, the typical ocean-going vessel of the future will be one of great length and breadth, in the interests of economy in transport. It is economically impossible to drive vessels of small length and draught at a

high speed, say, over 18 knots, unless a large additional passenger revenue may be expected, or unless the governments are prepared to come down handsomely in increased subsidy. High speed can be obtained at a reasonable cost only from broader and longer vessels, and these attributes cannot be economically secured unless the draught is increased with the length.

This means that the British and Dominion governments will have to provide for these vessels of greater draught (say 38 feet as a provisional maximum), by deepening the harbours and waterways at the great ports along the various routes. In this country Southampton affords sufficient water both in the approach channels and at quays and docks, for these great ocean liners, but London and Liverpool would have to be developed in certain respects. It is satisfactory to know that the port authorities in both cases are making provision for the largest vessels likely to seek harbourage for many years to come.

To turn to Canada—Halifax, and Quebec provide depth enough, while Montreal is not yet available. Cape Town, Durban, Fremantle, Adelaide, Melbourne, Wellington, Auckland, Lyttelton and Dunedin, will have to be taken in hand if they are to welcome the 38-foot steamer.[1]

The development of steamship and locomotive engine might have seemed in itself

[1] See selections from the Report of the Imperial Shipping Committee in Appendix IV.

sufficient to take the virtue out of the old arguments from space and time brought against all proposals for closer Empire unity in the eighteenth century. The statesmen of those days never dreamed of such a system of swift and regular communications over ocean and continent as that with which the Empire is equipped to-day. Coming down much later, Richard Cobden himself had no prevision of the effect of these scientific and mechanical inventions when he assured the English farmer that he would always enjoy a natural protection against the imported products of the New World.

But these last few years have witnessed further wonders in mechanical invention, which promise as big an advance on the railway and steamship services as these were upon the " windjammer " and the stage coach. Aviation as a practical science is only about a dozen years old. We are still in the experimental stage. There is no doubt that its effects on the internal conditions of the British Empire and the relations of the Empire to the outside world are going to be enormous, though it is difficult as yet to predict and assess them. In general we may say that aeroplane, airship, flying boat and other aircraft, will carry mails and merchandise and passengers at about one-third of the time now expended on journeys long and short.

No invention could have been of happier augury for an Empire whose different parts are

separated by such vast abysses of ocean, and which contains huge continental areas that it might be impossible to provide with adequate railway facilities. Already the longest flights which the British Empire and the planet afford have been successfully achieved by aircraft. Every day I can see, from the window where I write, the great aeroplane winging its intrepid way between Manchester and Berlin. The journey between London and Sydney in Australia, via Cairo, Baghdad, Karachi, Delhi, Calcutta, Rangoon, Singapore, Port Darwin, has already been accomplished, and when a service is fairly established, will take six or seven days instead of the present twenty-nine, with another day onwards to New Zealand.

From Cairo an All-Red route has been mapped out over the six-thousand mile trail from there to the Cape. Forty-three aerodromes are ready for the first aeroplanes that wing their way over the jungles and forests of equatorial Africa. Even the imagination of a Cecil Rhodes never pre-figured a Cape to Cairo route of this super-terrestrial kind. On no other route, perhaps, could the advantage of air-transit be better illustrated. Take for example, the stretch of nearly two hundred miles on this Cape to Cairo route from Mwanza, at the southern end of the Victoria Nyanza to Tabora, a city in the centre of old German East Africa. Over the impassable forests of this section of the route, the aeroplane lightly

flies, in a couple of hours, indifferent to the character of the country below, which would compel a trek of a dozen days with all the difficulties of porters and the danger and distress of a mid-African "safari" at their worst.

Aviation has quickly supplied Australia with that north and south communication for transport which is so greatly required in the various interests of the Commonwealth. Port Darwin in the Northern Territory is no longer parted by an unbridged gulf from the centres of culture in east and south. Eleven stepping stones or aerodromes already mark the aerial route from Darwin to Melbourne into stages, and by this air-track, which has already been flown in both directions, mails, light luggage, and passengers may be carried in the most economical way.

In Canada, too, aviation is destined to play a great part. The 2000 miles between Cork and St. John's (Newfoundland), have been flown and will be more and more within the scope of the flying-boat of the future. From St. John's to Halifax (Nova Scotia) offers no great difficulty, and thence the route continues to Quebec and Montreal. Thence begins the transcontinental journey to Vancouver, via Toronto, Port Arthur, Winnipeg, Saskatoon, Edmonton, the first portion of which especially is over a series of vast inland waters well-adapted to the operation of the flying-boat. "Canada, as a whole," writes Sir Frederick Sykes, "offers

a good example of the geographical conditions affecting ordinary commercial intercourse by air, and the utility of aircraft in providing the means of developing virgin lands where neither railways nor telegraphs have yet penetrated. For instance, an air route, employing either land or water aircraft, might be established on the line of the great lakes, linking up the commercial centre of Montreal with Port Arthur, the gateway of the west, then onwards to Winnipeg, whence lines would radiate into the north-west. Or, again, an air organisation could assist the settlers who are ever pushing their habitations and carrying civilisation into the northern districts of Quebec, Ontario, and the Prairie Provinces."

We may foresee, therefore, an enormous acceleration of Empire postal services. Let us take, for example, the journey to India. If the aeroplane fly 100 miles an hour by day only, the transit will take six days. But, for mails and parcel-post, at least, there is nothing to prevent night-flying, which would enable the journey to be done in seventy-two hours. The advantage will be very great when a daily service of aeroplanes, flying in light and darkness, is thus established, when the sender of a letter has not to wait perhaps a week before the mail goes, but knows that on whichever day he posts his letter it will start for its destination the next morning.

As regards this estimate of seventy-two hours

between London and Delhi, it is interesting to note that, for the first time in history, the post is outstripping the passenger. "The speed of the post," writes Sir Charles Lucas, in a very informing chapter," was, in Roman times, and is in our own, the speed of the fastest travelling human being. A man travels faster now than he did in Roman times, because he travels on land or sea by steam, instead of on or behind horses and in sailing-ships. A post is carried faster for the same reason. But whether the letters are carried by relays of mounted couriers, as among the Persians and the Romans, or by railways, the letter travels no faster than man, assuming the man to have sufficient endurance. Letters are sent from London, via Brindisi, to catch the mail steamers for India and Australia at Port Said, but a man can travel by the same route and arrive at the same time. Thus, if we take steam alone, although steam communication is from one point of view wholly different in kind from communication by horses on land and sailing-ships on sea, from another point of view, not so much in kind as in degree, for the speed of posts in relation to men has remained constant, being as a matter of fact one and the same for letters and for human beings." [1]

The aeroplane seems to have reached and passed the limit of "sufficient endurance" in human beings. According to Sir Sefton Brancker, Director of Civil Aviation, Air

[1] *Greater Rome and Greater Britain*, pp. 39-40.

Ministry, it would be physically impossible for passengers to India to travel continuously day and night at 100 miles an hour and thus do the journey in seventy-two hours. Mails and parcels could do so, but passengers would have to be dropped for the night, and catch another aeroplane next day.

But the airship, as well as the aeroplane, is likely to play an important part in bridging the gulf of space and time in our widely dispersed Empire. There are differences of opinion on the future utility of the airship. These vast fabrics are unquestionably unwieldy. They are particularly subject to the influence of wind, which retards their speed and renders mooring a difficult, if not dangerous, business. Moreover, the expense of construction is very great. The partisan of the aeroplane has usually a supreme contempt for these glorified balloons.

But despite all such criticism the government has decided to make the airship, if possible, a permanent feature of our system of communications. Sir Samuel Hoare, then Secretary for Air, announced in the House of Commons, on July 26, 1923, that the government, acting on the advice of the Committee of Imperial Defence and the Imperial Shipping Committee, had decided to resume the development of airships, and had accepted in principle a scheme by which a bi-weekly service of six large airships to India would eventually be set up.

He said: "The question of the development of airships has recently been considered by the Committee of Imperial Defence and the Imperial Shipping Committee. The Committee of Imperial Defence attach considerable strategic value to the airship, while the Imperial Shipping Committee consider that it is by airship service that the carriage of mails can most cheaply be expedited to the Far East and Australia. The government, therefore, have decided to resume the development of airships, and to proceed if possible by means of a commercial service rather than by State operations. Proposals have been placed before them by Commander Burney by which a bi-weekly service of six large airships to India will be eventually set up. The government have accepted the scheme in principle, subject to the details of the contract being satisfactorily settled by the Treasury. The House of Commons will have an opportunity of considering the scheme when the details have been sufficiently agreed to. The Dominions are being informed of this decision, and it is hoped to discuss the question at the Imperial Conference with a view to their co-operation in this scheme. The administration of the scheme, so far as it is a matter of commercial aviation, will come under the Air Ministry."

The first business, it was understood, would be to erect mooring masts, and then to

construct one gigantic rigid airship of 5,000,000 cubic feet capacity, capable of transporting 200 passengers and 11 tons of mails at 80 miles per hour, a distance of 3,000 miles. The proposed service would bring Egypt within forty-eight hours' journey, Bombay in five and a half instead of the present seventeen days, and Australia within eleven days in place of the present four to five weeks. It was estimated that the six airships would cost about one million pounds.

As Sir Samuel Hoare announced, the airship proposition in general and the Burney scheme in particular, were brought before the Conference (Economic), which met in London in October (1923). On October 19, the Air Minister explained that the Burney project was one of three stages. The first would be the construction of an airship, which would satisfy necessary requirements, and would be able to reach India in 100 flying hours ; the second stage would be the inauguration of a weekly service to India ; and the third would be a bi-weekly service to India, which would necessitate six airships of 5,000,000 cubic feet being in commission.

Sir Samuel slightly modified the above-given figures. He claimed that if the scheme were successful it would be possible to get from London to Cairo in two days as against five and a half to eight days at present, and to India in roughly five days, as against fourteen and a half. The journey from London to Perth

(Western Australia), would take eleven as against a prevailing twenty-eight days.

In the discussion which followed, the South African and Australian representatives, as well as those of certain Crown Colonies, stressed the need of developing the aeroplane as a means of carrying out surveys of difficult country. The Indian delegate expressed the great interest of India in the speeding up of communications promised by the airship service.

Mr. Amery, then First Lord of the Admiralty, who had made a study of the airship question, also made a very instructive speech, in which he expressed the belief that the airship had already reached the stage when its success was assured. He lifted the discussion to wider fields by a suggestion that airships in the future might go north-about to Canada over Iceland, and reach the West Indies by following Drake's course south-about. An airship, he said, could reach the West Indies in three and a half days. He drew attention to the increased efficiency obtainable by increasing the size of airships, and pointed out that an airship was much more comfortable to travel in than the average steamer or train, owing to the smoothness of its motion and the small amount of internal vibration. The airship also scored over the older forms of travel as it had not to follow the configuration of the country, but could head straight to its destination without any transhipment of passengers or cargo *en route*.

Mr. Amery further stated that the giant airship could be built with a much greater strength than the smaller vessel, so that unless some unexpected difficulties arose, airship travel would undoubtedly revolutionise Empire communications in the future. Other important considerations were, he said, that once design had been settled, airships could be built in a very short space of time—the standard Zeppelin during the war was turned out in ten weeks—while safety had been immeasurably increased by the fact that the inflammable gas could be surrounded by an envelope of inert gas.

It was agreed as a result of the discussion, that a Committee of the Conference should be set up to consider the whole subject of the Burney airship scheme, with the Air Minister and his expert advisers, the main object being to enable the Dominions to gather a complete and detailed view of the scheme.

The reader will be able to imagine the political and commercial advantages of such a reduction of distances as even the slower airship will effect. How much more practicable will the institution of an annual Empire Conference become, if the delegates can arrive *ab extremis oris* in ten days! How much more likely is the owner of capital in this country to invest in Australian enterprises, if he is able to visit that country, survey the business proposition on the spot, and get back home, all within a short month.

It would be hard to enumerate approximately the changes involved in these airship services alone. Thousands of Indian officials and business men who in present conditions are obliged to spend their leave in India, would be able to come home or go to more temperate climes, especially when the fares are brought within more general competence. The effect on other forms of communication would also be considerable. Posts are now so slow that the cable must often be used even for messages of no immediate urgency. The airship would carry such messages with quite sufficient rapidity. It might become unnecessary to lay down more submarine cables. Moreover, it is suggested, by carrying first-class passengers, the airship would make possible economical one-class moderate-speed marine craft.

It is significant of the manifold revolution which we have in prospect that Bedford, an almost centrally inland town, is likely to be the "port" at which, in the future, we shall "sail" to or arrive from Egypt, India and Australia.[1]

[1] In Appendix III an interesting lecture on Airships for the Empire by Commander F. L. M. Boothby.

CHAPTER V

TELEGRAPHS BY WIRE AND CABLE

Quick transport was not unknown under the Roman Empire. Letters could be sent swiftly by relays of horses to distant parts, just as in some countries to-day messages and posts can be carried at wonderful speed by human runners. It has, indeed, been said that we have improved on the ancients in the regularity rather than in the speed of communications. The old sailing-ship could attain a great speed under favourable conditions. Steam has given us a much greater mastery of the elements, and has immensely increased the reliability of post and passenger as well as commercial services by land and sea.

Mechanical invention, therefore, has meant a development in degree rather than in kind. Telegraphy has not simply bridged: it has annihilated space. We can send our thought across vast distances at an infinitely greater speed than we can transfer our persons. The speed of our communications is no longer measured by the maximum rate at which a human being can travel. "The standard of the human being has disappeared altogether." Happenings in England are reported almost simultaneously in the Antipodes. The result

of the Derby at Epsom is known there within two and a half minutes of the finish, that is as quickly as it is known to the public at Charing Cross. The present Prince of Wales, when touring India, was throughout in continuous and immediate communication with the Royal Family in England.

And these revolutionary conquests of space and time are only of yesterday. The Eastern Associated Telegraph Companies celebrated the Jubilee of their incorporation only last year. The result of the Battle of Waterloo took days to arrive in this country. President Lincoln had been dead a fortnight before the news of his assassination reached England. When the Prince of Wales of those days was travelling in India in 1869, the record of his progress took four weeks to arrive by mail.

In an Oceanic Empire like the British, the submarine cable was even more important than the land wires and telegraph posts. It was almost exactly at the middle point of the nineteenth century that the first cable was paid out into the sea between Dover and Gris Nez. It was regarded as an amusing curiosity, and many people seem to have thought that it was operated, like a bell-pull, by tugging at one end.

Then came the project of a trans-Atlantic cable, the early failures, and the final success of the *Great Eastern* in picking up a lost cable, and finally completing the line. This

was in 1866. A little verse published in the magazine of the *Great Eastern* staff commemorates the achievement :

" Here's to the cable of dear Fifty-eight,
Here's to the one Sixty-five, sir,
That we left in the sea in a critical state,
For which we intend to go dive, sir."

From 1866 to 1870 cables were laid in all directions. Even before the trans-Atlantic cable was completed, the link with India was working. I have before me a copy of the *Daily Telegraph* of March 10, 1865, with a three-column article headed modestly and in small capitals " The Telegraph to India." There was little or no " boosting " of an event which in these days would have been heralded with the most gigantic captions a newspaper could furnish. Indeed, we are informed that " it was not until a message from Calcutta, dated Thursday, March 2, was published in our number of the following day, that the general mass of the public were even informed such an undertaking was seriously contemplated."

The completion of the cable between Bombay and Bussorah at the latter place, is embedded in a paragraph three-quarters of a column long, without any cross-headings. Whether our modern hysterical methods of announcing events is an improvement may perhaps be questioned.

"It now only remained (writes the *Daily Telegraph*) to complete the line from Bombay to Bussorah. This was, however, a work of no ordinary difficulty, owing to the shallowness of the water, and the depth and softness of the mud. On the 4th of April the *Amber Witch*, having taken a quantity of cable on board, steamed in as near as her draught of water would allow her to go (about five miles). About five miles of cable, weighing some 20 tons, were then distributed among ten of the largest boats belonging to the fleet; and early on the morning of the 5th of April, the long floating procession started from the *Amber Witch* towards the shore. When some four miles of cable had been paid out, and the boats were about one mile from the semi-fluid bank, which was dignified with the name of shore, the boats grounded. Though there was very little depth of water, there was any depth of mud, of about the consistency of cream. There was no use in hesitating; the cable must be landed at any risk; so Sir Charles Bright, to set an example to his staff and the men, was the first to get out of the boat and stand up to his waist in the mud—an example which was followed by all the officers and men, upwards of a hundred in number, who were all soon wallowing in the soft yielding ooze up to their chests, but still dragging the end of the cable with them. The progress through such a material was necessarily slow: half

swimming, half wading, it was impossible to rest for a moment without hopelessly sinking below the surface ; yet no one thought of abandoning the cable. Though it was only two o'clock when the party left the boats, and the mud bank to be traversed was little over a mile, it was nearly dark before the last of the party reached the shore. All were grimed with mud, and nineteen out of twenty were nearly naked, having lost or abandoned almost every article of clothing in the struggle to reach the land. But, in spite of obstacles, the cable had been landed, and that at least was some consolation. But the troubles of the party were not yet over, for it was found that the ships of the expedition which were waiting to receive them in the Tigris, were lying at the other side of another mud-bank, only a little less fluid than that which had just been passed, and four miles in extent. To make matters better, a thunderstorm, truly tropical in its violence, was raging, and the tide, which washes the banks, was rapidly rising. The party, however, made a dash for it, and all succeeded in reaching the ships with the exception of one of the Lascars, who was overwhelmed by the mud and the tide, and sank before assistance could be afforded. The remainder of the party were much exhausted, some few so much so that they had to be carried by their companions."

It is well we should read passages of this kind. They remind us at what cost in struggle and heroism many of our blessings were achieved, which seem to-day so familiar and commonplace. It is also well that we should bear in mind the names of the pioneers in this development of submarine telegraphy—of Lord Kelvin, the scientist of the movement, Sir James Anderson, Captain of the *Great Eastern*, who proved that cables paid out and parted, were recoverable in great depths,[1] and of the late Sir John Pender, who gave generous financial support to the early undertakings.

The history of submarine telegraphy is largely that of the Eastern Associated Telegraph Companies, which were incorporated in 1872. In the year 1869, there were 8000 nautical miles of submarine cable in the world : to-day there are 325,000, of which 130,000 are owned by the Eastern group. This mileage is always growing longer. The Eastern Companies have laid no less than 28,000 miles of cables since the Armistice, and finality is not yet in sight.[2]

The Eastern group comprises the following companies :

The Eastern Telegraph Company, Limited.

The Eastern and South African Telegraph Company, Limited.

[1] Cables can be raised from depths of 3½ miles and successfully repaired.

[2] New main line cables have been laid between England and Gibraltar, Malta and Alexandria, Aden and Bombay, Ascension and Rio de Janeiro. New cables are being manufactured for service between Gibraltar, Malta, Madras, and Singapore.

The Eastern Extension Australasia and China Telegraph Company, Limited.

The Western Telegraph Company, Limited.

The West African Telegraph Company, Limited.

The African Direct Telegraph Company, Limited.

The European and Azores Telegraph Company Limited.

The River Plate Telegraph Company, Limited.

The Pacific and European Telegraph Company, Limited.

The West Coast of America Telegraph Company, Limited.

The Direct Spanish Telegraph Company, Limited.

The map will give a vivid idea of the developments in the last fifty years. The Eastern Telegraph Company has a practical monopoly of the traffic to the Near East, to India, the Far East, and Africa. Until recent years, indeed, the company almost entirely controlled the submarine communications of the Empire. That monopoly has been broken by the formation of the Pacific Cable Board, and the establishment of the All-Red route between England, Canada and Australasia. The board, with headquarters in London, consists of English and Dominion representatives—Australia 2, New Zealand 1, Canada 2, and the Imperial Government 3, including the chairman.

The All-Red route runs from London to Halifax, Nova Scotia, through automatic

repeaters at Penzance, and the island of Fayal in the Azores ; from Halifax to Bamfield (a small place in Vancouver Island, on the western coast of Canada), by Wheatstone duplex, through eight automatic repeaters ; from Bamfield to Fanning Island in central Pacific, this link from Bamfield to Fanning being the longest single stretch of ocean cable in the world ; from Fanning to Suva in the Fijis ; thence to Norfolk Island, whence the cable diverges on the one hand to Auckland, New Zealand, and round that way to Sydney, Australia, and on the other to Southport, near Brisbane in Queensland.

This line is All-Red in the sense that it touches nowhere but on British soil. The Pacific Cable Board leases and controls a line or two lines, when necessary, from Halifax to Bamfield, and down to the war, this and the submarine Pacific cable were the only sections under British state-control, but since the war, the British Government has come into possession of two trans-Atlantic cables, known as the " Imperial."

Cable stations are vulnerable points in time of war. The European conflict had scarcely begun when the Germans attacked Fanning, which is a small coral island such as we used to read about in our boys' adventure books. Two boats' crews were landed from a cruiser, and these made at once for the cable station, smashing everything they could lay hands on. They seized the papers in the office, found and destroyed a duplicate set of apparatus which the staff had concealed, and behaved in general

like the anthropoid apes into which warfare converts rational human beings. "The next morning," writes Mr. Avery, of the Central Telegraph Office, London, "the officer in charge of the station performed a fine piece of emergency work. Utilising a homely pickaxe, he constructed a grapnel, and managed to pick up the ends of the broken cable which the Germans had severed. He then improvised a wooden raft, which he anchored, and then fastened it to the broken cable ends, and made a through connection with a piece of covered copper. He then constructed a primitive set and got into communication with Suva and made known his plight." [1]

The Pacific Cable Board is laying new cables in Australasia in supplement of existing routes, and will soon duplicate the Pacific section of the All-Red route, as the great length of the cable between Vancouver and Fanning keeps the rate of signalling low and reduces the speed of the entire Pacific section.

England went into the Great War without a single trans-Atlantic cable in her possession—an example of "sloppiness" which is perhaps not unparalleled in our administrative history. Now that the war is over and the danger gone England owns two. During the war one of the German Emden-New York cables was cut on this side, and brought into Penzance, the other end across the Atlantic being picked up, and, with the addition of 300 miles, taken into Halifax. This

[1] *The Telegraph and Telephone Journal*, May, 1921.

line goes by the Azores, a Portuguese possession. England will obtain this cable as part of her war reparations from Germany.

The other sub-Atlantic cable was acquired from the Direct United States Cable Company, as an insurance against traffic interruption. It runs from the terminus of the London-Irish line at Ballinskelligs Bay in south-west Ireland to Harbour Grace in Newfoundland, where it is " relayed " into Halifax. From Halifax communication is made to New York, through a cable to Rye Beach on the United States coast. The eastern end of this cable may possibly be brought from Ballinskelligs and transferred to the Penzance repeating office. This second " Imperial cable " is leased on a short term agreement to the Western Union Company, but can be taken over at any time, when the quondam German cable is interrupted.

These Imperial cables are owned by the British Government and worked by the British Post Office, which keeps a staff in London, Penzance, and Harbour Grace.

It should be noted that there are other telegraphic services operating between England and the Far East—for example, the Indo-European. This reaches India by land via the continent of Europe and Persia, and is therefore scarcely an Imperial service in any sense. There are also other foreign services to the East through Siberia, with which we are not here concerned.

The use of these great telegraphic services

of which we have been speaking may be divided into two departments, the private or commercial and the Press. It is not necessary to attempt any comparison of the respective importance of these two purposes. Both are of the first moment in the linking together of widely separated communities. The Reports issued by the Dominions Royal Commission had much that was excellent to say on this subject of telegraphic communications. The Second Interim Report makes these remarks:

> "We feel convinced from a careful study of the problem and from personal contact with all classes in Australia and New Zealand, that the feeling of devotion to the Empire, and of loyalty to the mother country, will be strengthened in proportion as increased facilities are offered for keeping in close personal touch with friends and relatives overseas. Cable communication tends to quicken the pulse of nationality, and forms an effective supplement to the broader, though slower, interchange of thought and sentiment by means of postal communication. It reinforces the feeling of joint life in a manner not possible by correspondence when two months or more are required for a reply to any letter.[1]

It is scarcely needful to insist that the submarine cable should be available in the fullest and freest way for Press messages. There can be no essential unity or corporate

[1] *Cd.* 7210, p. 40.

life in the Empire, unless every part is supplied with the news of common Empire interest. It is not simply necessary that the Dominions and Dependencies should know what is going on in England and *vice versa*. All the important Canadian news should be reported in the newspapers of Australia ; South Africa should know what is going on in Canada, and India, and so forth. British news, that is, news interesting or important to all British subjects, should be widely disseminated to the farthest frontiers and recesses of the Empire. But—and this is a point to which we must return—the news must pass through British channels and not be coloured, or even contaminated by passing through foreign pipes.

The question arises, and has been much debated since the Armistice, whether the existing private-owned companies have been serving as well as possible these social, commercial, and political interests of the Empire. And the further questions also arises—what step must be taken towards the cheapening of cable rates, both for ordinary and for Press messages. The subject is so controversial that, rather than express any personal opinion, I shall quote the carefully-weighed utterances of men whose bona fides are beyond dispute. The Dominions Royal Commissioners in their final Report,[1] issued 1917, say:

> " Cable communication outside its commercial use is at present practically a luxury ; we can only compare the use by the general

[1] *Cd.* 8462, p. 137.

public of the cable at the present time to the use of the letter service in the United Kingdom before the introduction of the penny postage in 1840. Charges are very high, and the scales extremely complicated ; it is often difficult to see what justification exists for many of the differences. The popularisation of the cable service can only come with a simplification of the charges, and their radical reduction. We should like to see some bold reform in the direction of lower rates which might revolutionise the cable system of the Empire as the introduction of the penny postage revolutionised the postal service of the United Kingdom. We are convinced that a scale which would permit at some time or other of the week, the exchange of messages in plain language to and from the farthest parts of the Empire, at a charge of, say, 6d. a word—a reduction which we believe could be effected—would attract an immense amount of traffic and serve to bring the distant communities of your Majesty's Empire into close and rapid contact just as the introduction of the penny post brought the remote parts of Ireland and Scotland into touch with London. The question is what practical steps can be taken towards the realisation of this ideal."

The reader will see what progress has been made in cable rates from the following table, which compares 1908 with 1923 :

CABLE RATES IN 1908 AND 1923.

PLACE	1908		1923					
	Ordinary	Press	Ordinary	Deferred	Night Letter	Week-end	Press	Deferred Press
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Australia	3 0	1 0	3 0	1 6	—	0 9 (with minimum of 20 words)	0 $7\frac{1}{2}$	0 $4\frac{1}{2}$ (Imperial-Pacific only)
Canada (Eastern) Newfoundland	1 0	0 5	0 10	0 $4\frac{1}{2}$	0 3 (with minimum of 20 words)	0 3 (with minimum of 20 words)	0 $3\frac{1}{2}$	0 $2\frac{1}{2}$ (Imperial only)
India	2 0	1 0	1 8	0 10	—	—	0 4	—
New Zealand	3 0	1 0	2 8	1 4	—	0 8 (with minimum of 20 words)	0 $7\frac{1}{2}$	0 $4\frac{1}{2}$ (Imperial-Pacific only)
South Africa	2 6	1 $0\frac{3}{4}$	2 0	1 0	—	—	0 $3\frac{1}{2}$	—
British East Africa	2 6	1 0	2 3	1 $1\frac{1}{2}$	—	—	0 $3\frac{1}{2}$ to 0 $6\frac{1}{2}$	—
British West Africa	3 6 to 5 0	—	2 6 to 3 0	1 3 to 1 6	—	—	0 11 to 1 4	—
British West Indies	3 0 to 5 1	—	2 6 and 3 0	1 3 and 1 6	—	—	0 $8\frac{1}{2}$ to 1 $0\frac{1}{2}$	—

Some useful reductions have been made, thanks largely to the Empire Press Union, in the rates for Press messages, but on the whole, as will be noticed, the remarks of the Dominions Royal Commissioners that cable communication outside its commercial use is practically a luxury remains true. Some of the charges seem quite unreasonable. Why should the Briton in these islands who wishes to telegraph to a relative in South Africa pay 2s. 8d., when the rate to New Zealand is only 2d. higher? Under a system of State-controlled cables, administered with a single eye to public convenience and Empire interests, such an anomaly would find no place.[1]

Whether the further and drastic reductions which the social and political interests of the Empire demand, can ever be obtained from private companies working first and last for a maximum profit may be doubted. The wise members of the Dominions Commission were clear that it is unlikely. "We recognise," they write, "that these companies have shown great enterprise in the past, and that during the war they have done their utmost to foster communication within the Empire, with the result that the cables have been utilised in far

[1] The Commissioners state that in recent years (*i.e.* before 1917), the South African traffic had been so small that, in spite of "deferred" and week-end facilities accorded, the private companies operating the service had been entitled to receive the full subsidy of £13,500, paid by the Imperial and Union governments, and the British South Africa Company. This subsidy was payable in full, when the total receipts were less than £300,000. In the event of the receipts exceeding £300,000 half the excess was deducted from the subsidy.

greater proportion of their full capacity than ever before." [1] They go on to explain why the companies will not be in a hurry for a general reduction of rates. "In normal times cheap rates are only granted for non-urgent traffic in order to fill up the intervals between the hours of rush, and even this system is still in its infancy, and greatly in need of extension and development. The companies rely for the bulk of their receipts on high prices for full-rate messages. This method has proved satisfactory from the financial point of view, but it does not take into account the urgency of obtaining for Imperial trade and for social intercourse, between far distant communities, immediate reduction of the rates now prevailing." [2]

Telegraphic wires and cables are the sensory nerves of the Empire, and there is a growing opinion in the Dominions that it exceeds the capacity of private companies, working primarily for dividends, to provide adequately and single-mindedly for the system of inter-communications on which the existence of the whole British Empire depends. One cannot expect

[1] But Mr. Robert Donald speaking at the Press Conference in Ottawa (1920), said: "We need not waste sympathy on the Eastern Telegraph Company and its associates. It waxed fat during the war. It made huge profits out of the government. The cables were choked with official matter at 1s. 6d. a word. The casualty lists of Australia, New Zealand and India, every initial counting a word, represented a large revenue. The government made a great mistake in not taking over the Eastern lines, when war was declared. The cable routes were guarded by the navy and the companies made rich by government payments." (*The Imperial Press Conference in Canada*: Hodder & Stoughton, p. 166.)

[2] *Cd.* 8462, p. 137.

from a private company that their policy and principles shall be directed solely to the public advantage. If profit and public interest can be made to coincide, well and good: if they clash, profit must prevail. "The policy of the Eastern Cable Company," says Mr. Robert Donald, "is not to give preference to Press messages. The most profitable business comes first. In the case of a new state-owned line Press messages should have the preference."

It may be convenient to take the West Indies as an example of the unsatisfactory state of communications still existing in certain parts of the British Empire. Those islands are as a whole very badly provided with British news.[1] One of the most obvious reasons for this is the high charge for Press messages, ranging, as will be seen from the table already given, from 8½d. to 1s. 0½d. per word. It is impossible for any British West Indian newspaper to afford a special correspondent in England with a cable service of its own, and apparently no news agency seems to include the islands in its scope, the only exception being the subsidised messages cabled from Halifax (Nova Scotia) to Kingston in Jamaica by the Direct West India Cable Company.

This service from Halifax seems to be the only supply of telegraphic news in the British islands, though the Bahamas, it may be mentioned, have wireless communication with the

[1] See a Report of the Empire Press Union upon the West Indies (March, 1923).

Florida coast. From Kingston in Jamaica, the news from Halifax is distributed by the West India and Panama Cable Company. This supply of news does at least serve to keep the islands in some sort of touch with the great world without, but, as we shall see shortly, the news itself is prepared for American and not British breakfast-tables.

The West India Cable Company are under contract to supply 400 words of news per day, for which the Jamaica Government pays it a subsidy of £1000 per annum. As a matter of fact, the daily bulletin extends to over 3000 words.

The combination between these two cable companies works, with certain qualifications, not unsatisfactorily, but the same cannot be said of the two other inter-island cable systems, the West India and Panama Telegraph Company and the Cuba Submarine Telegraph Company. The former runs from Key West in Florida, and the two companies, it seems, have a perpetual working agreement whereunder each undertakes not to enter into any agreement for cheapened through rates by an alternative route. Interruptions, frequent and long, as well as high charges, evoke many complaints about the conduct of these services.

In 1914, the West India and Panama Cable Company received an annual subsidy of £26,300 from British and Imperial funds. This subsidy lapses in 1924, and the British Government decided to lay a cable direct from

Bermuda to Barbados, providing an all-British route. But the Empire Press Union, jointly with the West India Committee, urged an alternative scheme for a cable from Turks Islands to Barbados, Trinidad and British Guiana. This extension will soon be effected. The Duke of Devonshire, then Secretary of State for the Colonies, addressing the Imperial Conference, October 3, 1923, said :

> " Telegraphic communication between and with the West Indies has given rise to dissatisfaction for some time past both in those colonies, and, I believe, in Canada. The question was discussed at the Conference held at Ottawa in 1920, but at that time the existing contract with the West India and Panama Telegraph Company had still some years to run, and no immediate solution of the problem was possible. We have recently put before the Canadian Government and the West Indian Governments concerned a scheme for an all-British cable from Turks Islands to Barbados, with subsidiary connections by cable and wireless telegraphy to the other colonies. This scheme, which is based on the continued co-operation of the Government of the Dominion and of the Colonial Governments with his Majesty's Government, has now been accepted in principle by all the contributory Governments, and I hope that it will be carried out during the coming year.

"This scheme will afford an opportunity for an even wider measure of inter-Imperial co-operation than the existing arrangement for joint contributions to the West India and Panama Cable Company's subsidy. The proposed cable is to be laid and maintained by or on behalf of all the governments concerned, and as it is impossible for them to undertake directly an enterprise of this nature, we propose, if the Dominion Governments represented on the board see no objection, to ask the Pacific Cable Board to undertake the management of the cables and wireless stations, which will be maintained under the scheme. We do not, of course, suggest that the board should undertake any financial responsibility in the matter. All we ask is that they will extend to this new all-British route the skilled management and control which have been so successful in maintaining the all-British route across the Pacific. If our proposals are accepted, as I sincerely trust they will be, this new development of the activities of the Pacific Cable Board will form an interesting example of a board, constituted for one inter-Imperial purpose, being subsequently employed for another kindred inter-Imperial purpose, and will show in practice how co-operation between British administrations once started in any sphere tends inevitably to grow. We could ask for no happier augury of the outcome of the first Economic Conference."

An extension in another direction from Turks Islands to Nassau has also been suggested, as the Bahamas have as yet no cable connection with anywhere, though Nassau is in wireless connection with Florida.

The West Indies, like the Pacific islands, would seem to provide just the opportunity to which wireless telegraphy is adapted. There must always be some drawback in this imperfect world, and the threading of these jewels of the Caribbean on the invisible string is subject to " atmospherics " which, during nine months of the year, greatly interfere with the wireless messages. Science may, however, surmount this difficulty in course of time and experience. Certainly it is very desirable to develop wireless in these regions because the ocean-floor is so rocky and irregular that cable laying and maintaining are very expensive.

The several wireless stations now existing in the West Indies are mostly on American territory and owned by Americans. In 1909 the Direct West India Cable Company erected a wireless station at Jamaica, and it has continued to operate. Unfortunately, this station is of little use to British Honduras, whose position with regard to British news is deplorable. There actually exists at Belize (Honduras) a wireless station capable of sending and receiving messages in connection with Jamaica. But the Jamaica station is at present not allowed to be used for transmission of other than ship to shore (and *vice versa*) communications.

And though this Kingston wireless set can receive messages from Belize, as has been proved by experiment, it cannot send messages thither except under unusually good atmospheric conditions. What is wanted is the replacing of the present set at Kingston by one of a higher power, and the extension of the West India Cable Company's licence to cover communication with Belize for all purposes.[1] British Honduras is an important British colony: yet it gets no British news at all, except such as reaches it by extremely irregular mails. No British colony ought in these days to be long in such a situation. It is a little humiliating that wireless messages from British Honduras have to be relayed from Swan Island through the good will of an American company.

I am not sure that British Guiana is in better sort than Honduras. A message sent from the Chamber of Commerce at Georgetown to Lord Burnham at Jamaica in January, 1923, tells a sad story in itself:

> Georgetown Chamber discussed Lord Burnham's visit. Extend greetings. Would welcome mission British Guiana. Cable service broken since 1919. Dependent solely wireless relay Trinidad. Strongly advocate all-British cable service. Atrocious mail passenger communication England.

[1] The Admiralty high-power station at Christiana (Jamaica), which could have established full communication with Honduras for all purposes, official, commercial and private, has been shut down.

Colony better served by American steamers and press bulletins than British. Mother country needs rousing to maintain closer contact these undeveloped Imperial Possessions.

The letter sent (January 31, 1923), by the President of the Guiana Chamber (Mr. C. Farrar) is worth quoting as an example of the slackness in the West Indies, and the great need of tuning up the communications in these parts :

" British Guiana has been worst served of all the colonies in this group, in relation to its size and importance. Its cable service has for years been a cause of constant complaint, the history of which it is unnecessary here to relate. It is sufficient to point out that the colony has been cut off from cable communication with the outside world since May, 1919, and prior to that the existing cable was subject to such frequent interruption as to make it little better than an apology for a service. Since 1919, the colony has been served by wireless, first by a small colonial station, which was demolished on instructions from the Admiralty, and then by an Imperial station under the control of the Admiralty, when the delays imposed upon messages to and from the Colony involved the community in losses on the disposal of sugar and diamonds running

into hundreds and thousands of pounds sterling.

"Since July, 1922, this station has passed under the control of the local government, and while conditions have somewhat improved it still requires upwards of two days for a message to reach British Guiana from London. In this connection it might be desirable to quote from a despatch sent to this colony in 1920, at the instance of the Imperial Communications Committee, which states :

> The atmospherics in the West Indies appear to be exceptionally unfavourable, particularly at Jamaica, and messages are constantly being delayed because the stations cannot communicate with one another. The Admiralty are of opinion that no reliable commercial service can under present circumstances be guaranteed and that the conditions in the summer are more unfavourable than during the winter. Messages are liable to delays of several days whenever atmospheric disturbances are prevalent. The accumulation of traffic awaiting transmission at these times gradually grows.

"The Chamber suggests that the conclusions of this committee provide valuable premises, leading to the solution of our local cable difficulties, among the principal of which is an extension of the all-British cable from Bermuda to Barbados, and thence to British

Guiana. The Chamber is of opinion that an extension to Barbados, and thence direct to British Guiana, is more desirable than via Trinidad, since it is informed that a cable between Trinidad and British Guiana is more liable to interruption than one between Barbados and British Guiana. It is also felt that with such a great length of cable via Trinidad between British Guiana and Barbados the risks of interruption are greater, either on the Trinidad-Barbados, or Trinidad British Guiana section, than on the shorter and more direct route between Barbados and British Guiana. The fact also that Barbados seems destined to be the landing-place of other services—notably the Barbados to Miami cable—makes it desirable that Barbados should be selected for direct connection to British Guiana in preference to Trinidad, which in event of isolation from Barbados by its solitary line would leave British Guiana equally isolated."

The West Indies, in general, need a speedy reform as regards their communications with the British world to which they belong. The insufficiency of the cables makes a good and regular mail service the more necessary, but here too is a lame state of affairs. No adequate inter-island mail system exists, and letters from one island to another usually travel via New York, and occupy weeks in arriving at their destination ! Nor has the aeroplane managed

as yet to supplement the steamer. Aviation schemes have been started, only to fail, and apparently the only regular service of aeroplanes plies between the Bahamas and Key West, carrying passengers and mails, but this is an American affair.

Not only is the news service to the West Indies inadequate : it is also very largely non-British in character. His Majesty's lieges in these oldest of British possessions have to read their news about England, the British Empire and the world in general, through American spectacles. The news flows through American channels. It is not meant that those who compile the messages deliberately distort the tidings or try to interfere with the loyalty of British subjects. But an unintentional colour is given inevitably to the news. The stress is laid on things interesting to the American rather than to the English reader. In order to see exactly what this means in chapter and verse, the following letter written by Mr. E. J. Partridge, editor of *The Trinidad Guardian*, to the Empire Press Union visitors, should be read. It is dated January 27, 1923 :

> " I desire particularly to call attention to the manipulation of the news service furnished as part of their contract by the West India and Panama Telegraph Company.
>
> " Apart from the fact that the selection of news is carried out in a very perfunctory manner, there is the very much graver

objection that the whole of the news telegrams are compiled not from British, but from American sources.

"When this point was raised some years ago, I understand that the company replied to the criticism by appointing a representative in Halifax to compile the news telegrams, and claimed that by so doing the service became of British origin. This is, of course, absurd. The Canadian Press is almost as badly situated with regard to British news as are the West Indian Colonies. Their news is furnished by the American Associated Press, and it is a summary of news supplied to the Canadian newspapers by the Associated Press which is sent to the West Indies.

"The result is that much of the news, especially political news, is presented from the American viewpoint, which is not always accurate, and in some cases suggests inferences which are not only incorrect but detrimental to British interests.

"Of this, two recent examples may be cited. When the publication, by Dewar & Boraston, of the much discussed Lord Haig book was announced, the public news telegram described it as 'another book telling just who won the war,' and referring to the claim that it was Haig and not Foch who planned the counter offensive which ended the war, remarked, 'naturally it (the book) is being cordially received by the British public.'

This statement was quite untrue. The reception of the book in England was extremely critical and generally unfavourable. The effect of this telegram was to cause intense indignation amongst the large French-Creole population of Trinidad.

"On December 29, a telegram was sent out in the public news service giving the first intimation of the discovery of the treasures of King Tutankhamen's Tomb. The wording was as follows: 'Some of the priceless treasures found in the tomb of King Tutankhamen saw daylight for the first time in more than three thousand years yesterday, when Howard Carter and Arthur Mace, excavators of the Metropolitan Museum of Art in New York, superintended their removal.'

"Here was a statement obviously dished up for consumption by American readers, with no reference to Lord Carnarvon, or any acknowledgment of the fact that the discovery was made by a British Expedition, although for two weeks previously the English papers had been giving this most important find the utmost prominence, and Lord Carnarvon's full narrative was published in the *Daily Mail* of December 18th.

"With regard to general news it is frequently to be observed that events of interest to British people go entirely unrecorded. For example, the deaths of Sir Charles Santley, George R. Sims, and Marie Lloyd, three

people who for many years held unique positions in British popular estimation all over the world, were not considered worthy of mention in our telegrams, but we received prompt intimation of the demise of the widow of Alexander Graham Bell, the telephone inventor, while the illness of Madame Schumann Heink, who, I believe I am right in stating, appeared only for one season in London in 1898, and has remained in America ever since, was made the subject of a sympathetic message.

"These few recent examples are typical of the manner in which the news service to the West Indies is handled, and it is clear that there can be little improvement until the news is compiled from English sources instead of from American.

"I presume it will not be disputed that the presentation of British news for British readers is highly desirable, and, while the Americanised version of British affairs may not often do very much harm, there are occasions when the interpretation placed by American correspondents on British events is inexpedient, if not wholly erroneous.

"Unfortunately, the suggested all-British cable between Halifax, Bermuda, Barbados, and Trinidad, does not provide a complete solution of the matter, because we should still be served with news from Canada. The problem of the West Indies is really the problem of Canada, and although the

question of Canada's news service is, I suppose, outside the scope of the Conference instituted by Lord Burnham, the fact must be recognised that if the West Indies news service is to be relayed from Canada, we shall continue to receive much the same sort of news as is sent to us now, so long as the Imperial authorities are content to allow Canadian newspaper readers to be fed with American news. . . .

"As an Englishman with twenty-two years' newspaper experience, thirteen of which have been spent in the West Indies (Demerara and Trinidad), I do wish to press most strongly the desirability of securing for these colonies an all-British news service. I am aware that the financial difficulties are very great and may not be overcome for a considerable time, but I hope to see the day when we shall have an all-British cable affording cheap Press rates, which will enable not only the provision of a reliable British news service to the West Indian colonies, but also encourage better news communication from the colonies to the London Press. At present the West Indian news published in London is transmitted almost entirely from Jamaica, which is not satisfactory to the other colonies."

This persistent infusion of non-British news into British possessions is being corrected by sundry influences. Canadian news is being

progressively de-Americanised by such improved services as Reuter's Agency is now sending out, by the new Imperial cables beneath the waters of the Atlantic to which reference has been made, and by a better distribution of news over the Canadian Press by the "Associated Newspapers." It is understood that these Reuter messages are now available for any Canadian newspaper which wishes to have them.

American news, by which is meant world news laid on through American pipes, competes and must continue to compete strongly with news coming direct from England and the other parts of the Empire. The Associated Press of New York gathers an enormous mass of information from all parts of the world, including the British Dominions and Dependencies, and sends it forward at speed into Canada in order to get there first.

This Americanised news carries with it a strong temptation of cheapness. A Montreal or Winnipeg newspaper, for example, pays for transmission only from New York, whereas for the Reuter service they have to pay for the entire transit from London. The New York service is therefore much cheaper than the direct British, and this still secures for it a preference with many newspapers which, *ceteris paribus*, would rather have the British.

The Reuter agency is doing good Imperial

work. It sends a service of Canadian news from Vancouver to Sydney. It is very desirable, as already remarked, to establish continuous news services among the various units of the Empire, to keep Australia, for example, well informed about affairs in Canada, as well as both Dominions fully supplied with news about the home country. News which passes through Canada to Australia, and from London to India, South Africa and Australia, should be dropped on the way.

Nothing will contribute more powerfully to these objects of Empire interest than a big and progressive reduction in cable rates. A uniform cable rate for the whole Empire is wanted, just as there exists a uniform telegraphic rate within the United Kingdom, regardless of varying distance. In his speech at Ottawa (Aug. 5, 1920), Mr. Robert Donald made a bold and resounding challenge. "Let us suggest something," he said, "which will strike the imagination of the people, and wake up our statesmen. Make our objective a penny or two cents per word throughout the British Empire (Applause). There is no difference in principle between carrying a letter 15,000 miles for a penny, and in flashing a word over the cables at the same rate. . . . . If we are desperately in earnest about Empire unity, a penny per word cable rate is the best way of advancing it."

With regard to the desirability of maintaining the British character of news circulated

through the Empire, some words may be said here on the postal service. Until recently, no attempt had been made to counteract the undue prevalence of foreign magazines and newspapers in British states. In any case, it is impossible wholly to neutralise the effect of geographical nearness. The great American Republic, with its hundred millions of people, must inevitably exercise a strong pull on a small community of eight millions, with which it marches along a mainly invisible frontier of 3000 miles.

Moreover, nobody of wide culture or sympathy will desire to exclude foreign books and newspapers from British countries, or to convert the British Empire into a "geschlossener Staat." But for political reasons it is desirable that British ideas and ideals should have a fair chance of circulation through British Dominions, and with this object some efforts may well be made to correct the estranging or isolating effects of geographical distance. Canada was becoming so Americanised before the war that a preferential rate was accorded to British magazines and periodicals sent out to the Dominion. It may be questioned whether all these magazines were quite worthy representatives of the highest British culture, but on the whole they did tend to embody the life and fashion and thought that prevailed for the time being at the heart and centre of the Empire. That preference still exists, but I gather that it scarcely avails to cancel in any

degree the Americanising tendency which seems in this respect almost inevitable.

On this subject the second Imperial Press Conference carried a resolution, which ran: "This Conference is of opinion that postal rates within the Empire for newspapers and periodicals should not exceed the lowest rate in force between any foreign country and any part of the Empire." As regards letters the conference came to the decision that, "there should be cheaper postal rates for letters throughout the Empire."

Penny postage was introduced into the United Kingdom in 1840. It was extended to the whole Empire in 1898, by that great reformer, Sir John Henniker Heaton. The European war interfered with this as with most other good things, but the object must be to get back to that cheap uniform rate for the whole Empire. Uniform postal rates exist internally in all British Dominions. As a delegate pointed out at the Press Conference, a newpaper or periodical posted at Ottawa pays the same postage whether it goes across the river to Hull, or 2000 miles to Vancouver, or 1500 miles eastwards to Halifax. Such a system is so necessary to the social convenience and political interests of the Dominion, that the question of cost is not considered. That principle should be extended so as to include the whole Empire. New Zealand had much to do with the establishment of universal penny postage, and a New Zealander can send a letter

to a friend across the street or to another friend in Canada at precisely the same rate.

Indeed, if we wish to promote the solidarity of the Empire, and the communion of thought and sympathy among its constituent parts, cheap postage is even more important than cheap telegraphy. As already pointed out, the conquest of the air as a medium of transport involves great possibilities in the quickening and cheapening of postal services. The post, whose speed down to recent years was never faster than that of the human passenger, is now, as has been pointed out, beginning to outstrip that standard, and we are certainly on the eve of an enormous acceleration of letter and small parcel carriage. Wireless telegraphy and telephony and the ever-improving aeroplane, seem to be bringing us to the last word in the human supremacy over space and time.

Badge of Newfoundland.

CHAPTER VI

NEWSPAPERS OF THE EMPIRE

It is noticeable that a number of important newspapers in Canada and Australasia have recently been celebrating the Jubilee of their foundation.[1] As the German demands his national beverages wherever he settles, so the Briton insists on his newspaper. Any distinct community of British folk, however small and however remote, must have its paper giving primarily the local news and, as far as its resources permit, a certain body of information about the great world outside.

The Press of the Empire has grown very rapidly in recent years in influence and prestige. The opinions of the leading papers in the Dominions are now freely quoted in the Press of this country, and this custom is certain to be greatly developed by the new facilities promised through wireless telegraphy. We may expect that before long there will be inter-quotation, if the word be permissible, among the newspapers of the various Dominions. We shall find the Canadian Press, for example, quoting the views of the great

[1] *The Quebec Chronicle* must surely be the oldest of colonial newspapers. A facsimile of the first number has been issued, which bears the date, Thursday, June 21, 1764, that is some five years after the annexation of Quebec to the British crown.

South African and Australasian papers on questions of common Empire interest.

To give some idea of the extent to which newspaper enterprise has been carried within the borders of the British Empire, one may give a few figures relating to Canada.[1] To-day the Canadians have one hundred and twenty-six daily newspapers for eight million people, while Great Britain and Ireland, with a reading public of forty-five millions, have a hundred and eighty. But the Canadians are great news consumers, and they have altogether fifteen hundred and forty newspapers, of which one thousand and seventy-three are weeklies. The remotest parts of the Dominion have their local paper. Even in the sequestered Peace River district, three hundred miles from Edmonton and near the furthest northern boundary of wheat production, there are two newspapers. This is, indeed, characteristic of the whole Empire. Nairobi in East Africa has its two papers.

The Canadian Press is naturally influenced by the American across the border, but the development of British news circulation by wireless agency should tend to differentiate the Canadian newspaper in a British sense from the Press of the great Republic. The newspapers of Australasia and the English-written papers of South Africa are, as may be expected, much more distinctly British.

[1] See a very interesting lecture given by Lord Burnham before the Royal Colonial Institute, reported in United Empire for December, 1923.

Those who wish to comprehend in a few moments newspaper developments in the Empire, should take a walk through the big room in the Royal Colonial Institute, where a very large representation of the Empire Press is exposed to view. Such an experience is useful also to the general student of the Empire. Look at these rather primitive but plucky little newspapers published in the far Northern Territory of Australia or in some islet of the Pacific. A few moments spent over the local news, the leading articles and even the advertisements of these papers gives an impression of the local conditions of these abysmally distant places, inferior in vividness only to a personal visit.[1]

No existing agency has such a power and opportunity to influence as well as reflect public opinion and, therefore, to direct the destinies of the Empire as the Press. It was inevitable that among the other forms of Imperial co-operation and common counsel which have been initiated during recent years, in politics, commerce, education and other departments, some effort should have been made to bring the representatives of the Empire Press together in conference, and to consolidate their influence in favour of certain great objects, such as Empire unity.

This is an age of conferences, and one may doubt if any have been so resultful and influential as the two Press "palavers," held in

[1] See Appendix I.

London and Ottawa in the years 1909 and 1920. Much of the credit for the conception of the first conference must in justice be accorded to Sir Harry Brittain, who first grasped the prospective utility of such an Imperial Parliament of the Press. He found a powerful supporter in the late Earl Grey, then Governor-General of Canada. In England, the idea received the hearty good-will of such Press leaders as the first Lord Burnham, who was President of the first conference, Lord Northcliffe, Mr. Robert Donald, Sir Arthur Pearson and Mr. Kennedy Jones, backed by most of the " able editors " in this country.

In 1909, the shadow cast before by the stupendous disaster of 1914, was rapidly deepening, and many of the speeches contained unmistakable warnings of what might happen. I can recall the shock and thrill we all felt, who heard Lord Rosebery's speech to the delegates at the inaugural banquet. Few utterances of our public men have been so prophetically inspired, as may be evident from the following passage :

> " There is a hush in Europe, a hush in which one might almost hear a leaf fall to the ground. There is an absolute absence of any questions which ordinarily lead to war. All forbodes Peace, and yet, at the same time, combined with this total absence of all questions of friction there never was in the history of the world so threatening and

overpowering a preparation for war. Without any tangible reason we see the nations preparing new armaments. They cannot, indeed, arm any more men on land, so they have to seek new armaments upon the sea ; piling up this enormous preparation as if for some approaching Armageddon. . . . We can and we will build Dreadnoughts or whatever the newest type of ship may be, so long as we have a shilling to spend on them or a man to put into them. But I am not sure that even that will be enough, and I think it may be your duty to take back to your young Dominions across the seas this message and this impression : That some personal duty and responsibility for national defence rests on every man and citizen of the Empire. Tell your peoples—if they can believe it—the deplorable way in which Europe is relapsing into barbarism and the pressure that is put upon this little England to defend itself, its liberties—and yours. But take this message also back with you—that the Old Country is right at heart ; that there is no failing or weakness in her ; and that she rejoices in renewing her youth in her giant Dominions beyond the seas. You will return to your homes, missionaries of Empire, missionaries of the most extensive and most unselfish Empire known to history."

Mr. Balfour's warnings at the conference were also fully justified by subsequent events.

"If the fate of the Empire depends on fleet superiority," he said, "then that superiority must be shown in home waters. The German Ocean, the Channel, the neighbourhood of these islands, possibly the Mediterranean—these are the places at which, if there is to be an Armageddon, the Armageddon will take place, and it is folly for us to attempt or to dare to dissipate these fleet constituents so that when the time of crisis arises, we shall not be able to have that concentration upon which our whole Imperial destinies and the destinies of each separate portion of the Empire really and substantially depend. The fate of Australia, the fate of New Zealand, of Canada, South Africa, India—that is not going to be decided in the Pacific ; it is not going to be decided in the Indian Ocean ; it is going to be decided here. And no man can now speak on this subject of Imperial Defence without a note of anxiety in his voice."

In the light of what was to happen five years afterwards at Sarajevo, there was something almost uncanny in Lord Roberts's remark at one of the meetings of the conference that, "a shot fired in the Balkan Peninsula might produce an explosion which would change the fortunes of every remotest colony of our Empire."

This first Imperial Press Conference met for the discussion of practical business at the

Foreign Office, on June 7, 1909. The delegates included fifteen editors from Canada, fourteen from Australia, eleven from South Africa, five from New Zealand, six from India, one each from Ceylon, the Straits Settlements and the West Indies. There were among them native Indians, South African Boers, and Canadian French. Most of these leaders of public opinion were visiting this country for the first time, and every facility was given for seeing "its institutions, its public men, its national services, its ancient seats of learning, its hives of modern industry, its historic homes, its commercial and engineering enterprise, its rural quietude and its busy population."

It would be difficult to estimate how this Parliament of the Empire's Press stimulated the sense of common citizenship and the spirit of co-operation within the Empire, and thus contributed to the great Imperial réveillé of 1914, and to the ultimate victory of the Allies.

The Conference at its first sitting, with Lord Crewe, Colonial Secretary, in the chair, turned its attention to the practical question of better and cheaper means of communication throughout the Empire. It passed a resolution registering its opinion that it is of "paramount importance that telegraphic facilities between the various parts of the Empire should be cheapened and improved so as to ensure fuller intercommunication than at present." This resolution led to a supplementary one embodying

requests that the governments of the Empire assist in carrying out the reforms and making definite suggestions. A resolution was also passed recommending the laying down of State-owned cables to supplement and compete with the existing cable services.

The conference looked ahead as well as attended to urgent needs, and passed a resolution asking the governments of the Empire to " establish a chain of wireless telegraph stations between all British countries, because these are necessary means for the cheapening of electrical communication and for the safety of the mercantile marine." Unfortunately, the statesmen in power did not act on the recommendations of the Press, and the war found the Empire handicapped for lack of the Imperial wireless chain.

The only other resolution passed at the conference was one saying that it was desirable that the Press of the Empire should " act in concert in the wise direction of the surplus population of the mother country to those colonies which stand in need of additional settlers."

There were discussions on the Press of the Empire which opened up wide subjects, including Imperial Defence. One session was given up to speeches on " Literature and Journalism."

It should be noted that a year after the first Imperial Press Conference took place, the Prime Ministers of the Empire met in conference and resolutions were passed advocating

that "the use of all possible means be taken to secure a reduction in cable rates throughout the Empire." Another resolution recommended the laying down of a state-owned cable between England and Canada, so that the trans-Atlantic rates might be substantially reduced.

One of the most valuable outcomes of the first Press Conference was the creation of the Empire Press Union, which came into formal being at the end of 1909. Its Memorandum of Association thus defines its objects :

> "The promotion of the interests of the newspaper Press and of those connected with the publication of news and newspapers, and to represent, express, and give effect to the opinions of the members of the Union on all questions which affect the newspaper Press throughout the British Empire.
>
> "To promote the holding of conferences of members of the Union in different parts of the British Empire.
>
> "To facilitate the exchange of experiences and opinions amongst newspapers within the British Empire with a view to the general improvement and efficiency of telegraphic communication and news supplies, and the cheapening of the rates for carrying and distributing such information, and generally in every way to promote, support or oppose legislative or other measures affecting or likely to affect the aforesaid interests."

The Empire Press Union is an association of newspaper proprietors and editors, including in its membership the Press of the whole of the British Empire. There is no similar association of the kind. The President is Viscount Burnham, proprietor of the *Daily Telegraph*, who has thrown himself whole-heartedly into its work and aspiration. The Council in London (of which Mr. Robert Donald is chairman), includes proprietors, editors and directors of the leading newspapers and news agencies of the United Kingdom, and also representatives of the principal journals in the Dominions. The Union has overseas sections, with separate chairmen and executives in Canada, Australia, New Zealand, India, South Africa, and the British West Indies.

Since its foundation the Union has been responsible for reducing Press cable rates by 50 per cent. Two "Imperial Press Conferences" have been held, the first in the United Kingdom in 1909, and the second in Canada in 1920. The organisation of these conferences is an important part of the Union's policy. So far as is possible they are held at intervals of four years, successively in the various Dominions and in the United Kingdom, with the dual object of enabling newspapermen from all parts of the Empire to meet and discuss mutual interests and action to be taken by the Union in connection therewith, and at the same time of affording an opportunity for studying outlying

parts of the Empire in the most favourable conditions.

The Union is always ready and willing to put forward the views of its members, and to represent their needs, in Parliament, Downing Street, or Whitehall. It has the ear of every Department of State and ready access to official circles.

Whether by private negotiation or by public deputation, the Union can bring to bear the combined influence of all the newspapers and news agencies of the British Commonwealth. There can be no organisation commanding so potent a force. As a recent instance of successful pressure by the Union may be cited the reversal of the Imperial Government's obstructive attitude in regard to Empire Wireless.

The Union has been granted a special box in the House of Commons Press Gallery for the use of members in London, acting as correspondents of journals oversea. This is the first time that representatives of the Press of the Empire oversea have been allowed to report proceedings in the mother of Parliaments. Previously to the Union's agitation on their behalf the Dominions' newspapers had no *locus standi* in the House whatever.

The Union affords useful facilities to London correspondents of overseas newspapers. By a special arrangement all the principal government offices maintain lists of Dominions' Press correspondents in London, who are members of

the Union, for the purpose of issuing official information, tickets for Parliament, public functions, etc.

In all government departments there is appointed (at the instance of the Union), an official charged with the duty of interviewing Press correspondents.

The Union is able to afford considerable service to overseas members visiting London. The offices at 71 Fleet Street, London, E.C. 4, are always available to visitors and the Secretary, Mr. H. E. Turner, will gladly do anything he can by way of introductions, Press tickets, etc. The Union's offices have recently been much enlarged.

The membership subscription is £5 os. od. per annum for daily newspapers overseas, and £3 os. od. per annum for weeklies and covers supply, without any charge, of the quarterly *Journal of the Parliaments of the Empire*, a concise summary of the legislation of all the Parliaments of the Empire, in so far as it is of general concern.

The Union issues a "Circular" to its members, which is open to all for the expression of views and suggestions. Read as it is by about 300 leading newspaper proprietors and editors in all parts of the Empire, and also by government officials, the "Circular" is a useful medium for such purposes.

It may be stated here that the next Imperial Press Conference will, if possible, be held in Australia, in 1925, a cordial invitation having

been received by the Union from the Australian Press. The next Conference was due to be held in 1924, but it has been postponed until 1925, in order not to clash with the British Empire Exhibition.[1]

During the war the normal work and status of the Press were inevitably suspended. Press rates for news disappeared, the government having the first call on cable communication. News services operated in the leading strings of the Press censorship. Conditions remained abnormal for some time after the Armistice, and are only now returning to pre-war standards. In July, 1918, advantage was taken of the presence of a number of editors, chiefly Canadian, and of newspaper correspondents from overseas to hold an informal conference, which was attended also by the resident correspondents of Canadian, New Zealand, South African and Indian newspapers. The Right Hon. N. W. Rowall and the chief representatives of the British Press were also present. The conference was opened by Mr. Robert Donald, chairman of the Council of the Empire Press Union. Opening the proceedings, he said :

> " We have seized the opportunity of the visit of our Canadian friends to hold this Conference of the Empire Press Union, for an interchange of views on matters affecting our common interests. The originators of

[1] From information supplied by the secretary, Mr. H. E. Turner.

the Imperial Press Conference put two subjects in the foreground—Empire defence and improved methods of communication between different parts of the Empire as a means of spreading news and knowledge. There was no better way of promoting both objects, and other matters of common interest, than a gathering of editors who could exercise a far more permeating and enduring influence than a meeting of Imperial politicians. The first Imperial Press Conference marked an immense advance towards a better understanding between different parts of the Empire. The Empire Press Union has carried on the work begun by this first Conference. It has branches in every one of the great Dominions and in India, and practically all the leading newspapers of Great Britain are members. The Empire Press Union has a good record of achievement in the way of the increase of cable facilities and reforms in other directions. During the war we have secured new facilities for correspondents. Thanks to the persuasiveness and diplomacy of our President, Lord Burnham, we have broken down the exclusiveness of the Colonial Office. That most conservative of all Ministries has at last been convinced that newspaper correspondents from the oversea Dominions exist, and it has been persuaded to recognise their existence by receiving them and giving such information as it possesses or such information as it

would like them to have. The chief function of the Empire Press Union is to use the collective power and influence of the Press of the Empire to secure better facilities for the dissemination of news, and to promote the common interests of the Empire in unofficial ways, and without concerning itself with politics. To this end it advocates the further reduction of cable tolls, the extension of cables and wireless, better, quicker and cheaper means of communication of every kind.

"We firmly believe in the policy that the surest bond of union is a quicker means of communication between England and our sister communities overseas, leading to a better knowledge of each other. We want, therefore, to see and work for more cables, supplemented by wireless, a service of fast oil-driven ships, and an aerial express service for mails and passengers which will bring Canada within twenty-four hours' journey of London. At the same time the Union seeks to secure increasing facilities for correspondents who make their headquarters in London, or who visit us. Thus our policy, while directly in the interest of every newspaper, has a wider significance, and is for the benefit of the whole British Commonwealth of Nations. The Union has done a great deal of work in material things, but the chief benefits which it has brought to the Press of the Empire and to editors

cannot be measured by the reforms we have carried out or by the privileges we have won. Our chief success, our most enduring work, has been in the creation of a new spirit of brotherhood between newspaper men. New personal ties have been formed in all parts of the Empire, bringing men of influence into greater intimacy and closer friendship. The Union has aimed at focusing more closely the immense influence of the Press to help in harmonising the common interests, and in fostering the common ideals of all people who live under the British flag."

A rather disquieting proposal was at this time on foot. The Ministry of Information, a war-time institution which did not survive the return of peace, had suggested that a government news service should be organised, and this was under the consideration of the Imperial War Conference. No one who understands and values the liberty of the Press will fail to realise the dangers of such a proposition. Mr. Donald voiced the unanimous opinion of the Empire Press Union and the Conference. Referring to the scheme, he said :

" If it means that the government intends to set up an official bureau with an official news agency, subsidised and controlled directly or indirectly by government officials, we, on this side, are dead against

it. Let the government find us more cable facilities. Let it reduce cable and wireless rates to a minimum. . . . but let it leave the collection, supply and distribution of news to the resources and enterprise of individual newspapers and news agencies. Government action should stop with the provision of facilities. Newspapers will do the rest. A free and independent Press is the sheet anchor of our liberties. An official news service would undermine and destroy the freedom and independence of the Press. A great man[1] once said, 'Let me write the ballads of the people, and I care not who makes their laws.' Similarly, the government official newsman could say, 'Let me select the news for the papers, and I don't care who writes their editorials.' News can be made tendacious ; the most subtle, penetrating and dangerous kind of propaganda can go out in the guise of news. The Official news bureau could and would, at the dictation of a political chief, suppress news which it ought to circulate, and circulate news which it should suppress. Beware, therefore, of a spoon-fed Germanised Press. We went into this world-war with a free, clean and independent Press—let us guard that precious possession."

A resolution was proposed pledging the

[1] Andrew Fletcher of Saltoun, in "An Account of a Conversation concerning a Right to Regulation of Governments" (1703).

Union to use its influence to secure better, quicker and cheaper facilities for the dissemination of news throughout the Empire from British sources, and that government assistance should be limited to the provision of better facilities.

This resolution was seconded by Lord Burnham, who gave an interesting summary of the work of the Press Union. His lordship concluded thus :

> " I have been asked to second the resolution, and I do so with great pleasure, because it accords entirely with my own views. I hope to see the cable rates cheapened to an extent that will enable papers, without distinction, throughout Canada to give the most important of the home news, which, I am sure, they wish to, and which will be of infinite advantage. The complaint of the past has been that news in the Canadian papers has always had an American colour. Nobody complains of American colour now, but we feel that our point of view must necessarily be different from the American, and, therefore, the larger and more direct and constant the flow of news from this country to Canada is, the better it will be for the mother country and the better for the Dominion. Much can be accomplished in this way, though much has been done in Canada to enable the country papers in the outlying districts to have advantages which

have been confined to the cities hitherto. In this matter we want to be guided by your opinion. I do not attempt to dogmatise on the manner in which these news facilities should be carried through, but it seems to us, from our experience, that what the State should do is to grease the wheels of communication, but not supply the material. We have found communication on a mutual and voluntary basis the best for our common purposes, and it is just in dealing with cables and cable rates that the State, from the Imperial Exchequer and the Dominion Exchequer, can give us the opportunities which, if we have them, we shall be able to turn to good account."

The resolution was carried unanimously.

Similar occasional conferences among editors from the Dominions and India visiting England and British Press representatives, were held in the same year and in September, 1919. In 1920, the second great Imperial Press Conference, which should normally have taken place in 1915, was held at Ottawa. This memorable palaver was opened by an inaugural banquet held at Montreal on August 3, at which Lord Atholstan presided, all the Empire delegates of the Conference, representatives of the Canadian Press and leading journalists of the United States, as well as many well known public men of Canada, feasting together. Admirable speeches, breathing the

true spirit of Empire brotherhood, were delivered by Lord Atholstan, Lord Burnham, Sir John Willison, and others. Professor Stephen Leacock variegated the proceedings with a little characteristic humour. "I have been asked," he said, "to come and help welcome you to-night, and I cannot tell you by what great sacrifice I did it. I may tell you, however, that I have come from my farm in the country, and there the bugs are eating my farm away at this moment. I ought to be there. Those of you from the Australian antipodes know that of hand-picked bugs we have more this year than ever before, and I really should not have left. My wife clung to me and asked me to stop: 'The bugs first,' she said; but I said, 'No! the bugs come every year.'"

The conference again emphasised in speech and resolution the need of developing cable and wireless equipment in the Empire for the dissemination of news and opinion. It advocated once more a press message rate by cable or wireless of a penny a word, the cheapening of postal rates, and the increase in the volume of Empire news published by Empire newspapers. It also strongly championed the independence of the Press and deprecated any government interference in the selecting and editing of the news. It may be convenient to give here the chief resolutions passed in regard to these subjects:

(*a*) That this Conference is strongly of opinion that it has become necessary to secure

forthwith facilities for the better, quicker, and cheaper conveyance of news throughout the Empire, and calls upon the Empire Press Union to take immediate steps to attain this end.

(*b*) This Conference strongly recommends the Governments of Great Britain and Ireland, of the Dominions, and of India to encourage the development of cable, wireless, and other facilities for the exchange of news and opinion within the Empire, and to assist in securing reduced rates for such intercommunication; any such assistance to appear specifically in the estimates of public expenditure, and to be so directed as not to affect the quality of the news service supplied, or the freedom of the newspapers so served.

(*c*) This Conference is of opinion that the full utility of cable and wireless communications, as a factor in educating public opinion and in maintaining a good understanding between all peoples of the Empire, will not be attained until rates are reduced to a basic charge of one penny per word for Press messages throughout the whole of the British Empire.

This Conference is strongly of opinion that steps should at once be taken to provide the British Empire and the world with the advantages of wireless telegraphic and telephonic communications, and it urgently requests the Governments of the Empire to secure by public or by full facilities for private enterprise, at

an early date, adequate wireless services throughout the Empire.

That with a view to improving cable and wireless communications and inter-Imperial news service within the Empire, this Conference suggests that each delegation shall press upon its own Government the initiation of negotiations with the neighbouring Governments of the British Dominions for such improvement of cable and wireless communications between them as will be to their mutual interest and advantage ; information as to any action taken by delegations in this connection to be communicated to the Empire Press Union.

That a Committee be appointed in London by the Empire Press Union, consisting of the President, four representatives of the British Isles, and two representatives of each Overseas delegation, to take action requisite upon the resolutions adopted by the Imperial Press Conference (Canada, 1920) regarding Cable and Wireless Communications.

Postal Rates (*Letters*).—This Conference is of opinion that there should be cheaper postal rates for letters throughout the Empire, and the various delegations undertake to urge their respective Governments to take appropriate action ; the Empire Press Union to be advised by delegations of any measures they may take to this end.

Postal Rates (*Newspapers and Periodicals*).—This Conference recommends that postal rates within the Empire for newspapers and

periodicals should not exceed the lowest rates in force between any foreign country and any part of the Empire.

Dissemination of Empire News.—That, as Empire interests need a greater dissemination of knowledge concerning the Empire, this Conference urges the Council of the Empire Press Union to take such action as may be practicable to ensure the interchange and publication of a larger volume of Empire news, apart from political propaganda, by the newspapers associated with the Empire Press Union than at present pertains.

Independence of News Services and Maintenance of Privileges.—This Conference affirms that, whatever assistance be given by the Government in the interests of more extensive dissemination of Imperial news, the Press and all news services be, and remain, independent of Government control; and that all the privileges secured during and since the war be maintained.[1]

In these days when public opinion is the ultimate authority and the real sovereign power in the State, these Press Conferences, which are now, like the Imperial Conference, to be periodical, will be of great and growing political importance. The Imperial Conference will continue to represent the Governments in the Empire, and form the constitutional bond of the Britannic Commonwealth. The representation of the peoples in the wider sense will

[1] Other resolutions will be found in Appendix II.

be fairly provided, until the constitution of the Empire is more fully developed, by such institutions as the Empire Parliamentary Union and the Press Conference.

While people may differ about preferential trade and Empire federation, there is a very general consensus that improved communications are from every point of view, political, economic, and social, to be encouraged. An English visitor was condoling with an inhabitant of Lerwick because in the winter months Lerwick was frequently cut off from communication with London for a fortnight. "Ay," said the Lerwick citizen, "but think of London without tidings of Lerwick for a fortnight." He had the root of the matter in him. If the Dominions and the Colonies are gasping for news of the mother country, she is beginning to be anxious for more information about her offspring, how they are faring, and under what conditions they are living.

Reuter's News Agency has done incomparable service and some account of this great organisation must, therefore, be given.[1] One may say that if the P. and O., the Cunard and R.M.S.P. Companies and their associates were suddenly swept from the seas, the dislocation in Imperial inter-communication would hardly be more than if Reuters suddenly suspended operations. There would be dismay in every Dominion, and the tiniest British possession

[1] This information has been kindly supplied by Mr. Herbert Jeans of Reuter's Agency.

would suddenly find itself without its one direct link with the Empire. London is still the greatest commercial *entrepôt* in the world and it is incomparably the greatest news *entrepôt*. It is the nerve centre of the Empire, and the vibration of those nerves is faithfully recorded on the conscientious and impartial Reuter instrument to every part of the Empire. Indeed, the nerve system of the human frame is hardly less delicate and complicated than the machinery through which news is flashed through the Dominions.

The main trunk services of Reuters supply all British, European and American news to India, South Africa and Australia, while Canada has for some time been relieved of the reproach that she receives her British news through American channels by the ample service conducted by Reuters and the Canadian Press, their very able collaborators. These trunk services radiate and extend until they cover every spot where there is a British subject. The lonely Seychelles and Mauritius are not neglected, and Tokio and the whole coast of China receive a news service which the sub-editors of many a London paper would be glad to have, simply for their guidance in estimating the relative value of the news of the day. No news of political importance goes without its record and it is a nice task to weigh up the requirements of each Dominion as regards each class of intelligence. Some like long reports of speeches in order that they may form

their own considered judgment ; others prefer a crisp summary which tells its own tale. Some like a story of social doings in London, others like more serious matters and the discussions of grave social problems.

It may be said that Reuters carry the bulk of the news services, both British and foreign, to South Africa—and in South Africa is included both the West Coast of Africa and the East Coast, which with its Indian problem has been so much to the fore at the Imperial Conference—to India whose news sphere extends as far north as Kabul, south to Colombo and east to Burma, to Singapore and the Straits Settlements, to Hong Kong and the China Coast and thence up to Peking and Tokio, which is interested equally in British politics and British commerce ; to Australia, with all its ramifications across its huge extent of territory, and to Canada. This latter Dominion is particularly concerned with British doings, and the readiness of the Canadian Press as a whole to give publicity to every form of British activity is as interesting as it is striking.

There is ample room to supplement these great trunk services, and that is done partly by Reuters themselves and partly by the very able group of Dominion correspondents representing either individual newspapers or groups of newspapers in London who see that their respective Dominions are in no lack of well-informed comment and interesting gossip. The enormous growth of the Reuter services within

the last twenty years is at once a tribute to that institution, and an indication of the closer union of the Empire. The character of the news which is asked for is a sure sign that those who have left the mother country have not left their old interests behind. Those interests cover a wide field—from religion to sport—and those who have followed the fortunes of the Celtic, the Rangers or Aston Villa at home still want, under different skies, to know how their old favourites are faring. One factor in migration is frequently left out of account. The migrant plunged into a strange world and working under strange conditions cannot but feel lonely. If he is in touch with what is happening at home and, more important, his own home locality, he feels less isolated, and the further development of the news service to the remotest parts of the Dominions is a matter which should be seriously considered by all who are concerned with the emigration or immigration problem.

With this increasing desire on the part of the Dominions and the colonies for word from home there has been a corresponding development in the desire in Britain for news from the Dominions. People here want to know the conditions under which their relatives and friends are working, and the inward service from the Dominions both to Reuters and the newspapers individually is steadily increasing. The further expansion of this inward service is hardly less important to the Empire than the

development of the outward service, and the Dominions are beginning to realise that the best attraction for the best class of immigrant is information in every kind of form about the Dominion. The very mention of a particular Dominion in the Press is a harmless and useful advertisement and if the mention is coupled with information which throws some light on conditions in that Dominion interest is at once excited and thoughts turned in the desired direction.

There has been one very striking development in the inter-communication of Imperial news within the last few years. Not only do the Dominions want to know more about Britain, but they want to know more about each other. Twenty years ago one Dominion was almost indifferent to what was happening in another, but all that has been changed. Experiments in one Dominion are watched with interest by the others. The methods by which problems common to all are being tackled in one Dominion are studied closely in others. All this involves an interchange of news between the Dominions, and this interchange is effected in some cases direct and in others through the great *entrepôt* in London. South Africa is in direct communication with Australia but receives its Indian news—which in view of recent controversies has become increasingly important—through London, and Australian news of interest to Canada is also rehandled in London. And so the Dominions and India are making each other's close

acquaintance, and each Imperial Conference has a marked effect in stimulating the desire for a more intimate understanding of each other's problems and conditions.

It may not be out of place here to record appreciation of the great literary and technical skill of the British Empire Press. The standard throughout the Empire is amazingly high. News is presented brightly, fairly and intelligently, frequently under difficult circumstances, and the leader writer in the Dominions need not be afraid to look his august London colleague in the face.

The technical development of methods for the transmission of news is keeping pace with requirements and, although a further development and amplification of the physical means of communication is desirable, the various cities of the Empire are in amazingly close touch with London. Cape Town and Bombay receive important news with almost incredible rapidity. The result of the Derby is known there before many an English town is in possession of the news. Actually the last Derby result was cabled to Cape Town in two minutes, to Bombay in three, and to Melbourne in twenty minutes. What further developments there may be in cable communication, wireless and wireless telephone no one can forecast. But nothing is more important than that every part of the Empire should be fully abreast of everything of importance and common interest that is happening to the rest of it.

CHAPTER VII

"WIRELESS"

Less than twenty-five years ago it seemed that steamship and railway train and telegraph had done all that was possible in the neutralisation of the influences of time and space. In these years, however, science and mechanical invention have become thaumaturgic and achieved wonders of wizardry, which were never dreamed of at the end of the last century. Wireless telegraphy in its inception and early development is older than aviation, but even now it is still in its infancy, and its future influence on human and political life can scarcely be estimated.

Such an invention might seem to have been designed *numine deorum* for the behoof of a widely-dispersed and Oceanic Empire like the British. Without any visible or tangible medium it brings into instantaneous communication points that may be separated by half the circumference of the globe. The advantage of this in the case of the vast continental areas of Canada, Australia and South Africa is obvious. But the utility of wireless at sea and over sea-spaces is still more striking, as it obviates the great expense of laying and maintaining ocean cables. The islands strewn like

stars over the abysses of the Pacific, for example, may now be brought into a communion *inter se*, and with the world outside which would otherwise never have been effected.

And few humanitarian results ever achieved by science have been more beneficent than the effect of wireless telegraphy in linking the lonely plodding vessel with her invisible consorts near and far, and with the havens she has left, and to which she is bound. Nearly all the remaining terrors are thus removed from navigation. and even migration through the help of " wireless " becomes far less formidable in prospect.

It would be unsafe to predict that wireless telegraphy is going to supplement entirely the telegraph pole and the ocean cable. The wireless message may never have the secret and confidential character of that which is sent along the sea-floors, and the paths of the etheric waves are beset with atmospheric disturbances from which the wire is free. Yet some people anticipate the complete elimination of the wire before many years are past. " What a gross and material thing a telegraph or a telephone wire is beginning to be," exclaims a brilliant writer, Mr. W. Haslam Mills, in the *Manchester Guardian*,—" clumsy as a clothes-line ! " At present, however, it is unnecessary to say more than that wireless will be an incalculably important supplement of the land wire and the ocean cable.

The article from which I quote also suggests

once more a comparison between the services of the scientist and the statesman to the political development of the British. We have "universal miracle" on the one hand, and "universal mess" on the other. "Man as a scientist can do nothing wrong. Man as a statesman seems able to do hardly anything right." The history of wireless furnishes some illustration of this text. The scientist went steadily forward with the development of his invention. But so soon as he came up against politics and the politician endless delay and embarrassment set in. In fairness, however, it should be said that the recent attacks on the British General Post Office have not been wholly deserved. The public interest in its widest sense has to be the first consideration with such a public department.

The history of "wireless" is largely the history of Guglielmo Marconi, and the company which bears his name. It may be desirable to place on record the stages in the working out of an idea which is going to have a thousand times more effect on the destinies of the British Empire than any number of legislative measures or political speeches.

Wireless telegraphy, as we know it to-day, is the outcome of a chain of effort formed by the mathematician, the laboratory experimenter, the inventor, and the capitalist. In 1864, Clark Maxwell, working on purely theoretical lines, reached the conclusion that an electric spark or "disruptive discharge,"

would set up oscillations in the ether. In 1887, Hertz proved by experiments that Clark Maxwell's theory was correct. He demonstrated that an electric spark brings about the radiation of etheric waves which may be reflected, refracted, and polarised like those of light. In 1895, Mr. Marconi began his attempts to utilise these waves for signalling purposes. In 1896, he took out the first of the patents which were later acquired by Marconi's Wireless Telegraph Company and utilised in the development of a world-wide system of wireless telegraphy by land and sea.

The story of these early experiments is peculiarly interesting. Guglielmo Marconi was only twenty-one years of age when he began the attempt to put Hertz's laboratory experiments to practical use. His first efforts were made at his father's villa in Pontecchio, near Bologna, across distances of only a few yards, from room to room. The next step was to try longer distances in the garden ; and after numerous experiments the inventor was able to receive signals the length of the garden.

The apparatus employed in these experiments was very simple, and all the Marconi apparatus in use is a direct evolution from it. In the transmitter, Marconi used an induction coil to produce a spark between two balls, one of which was connected to a metal can hoisted on a mast, and the other to a metal plate in the earth. In the receiver he used an improved form of coherer, which will be explained later,

connected to a similar " aerial " and a similar " earth." This arrangement of aerial wires and earth connections was found by Mr. Marconi to give the maximum of reliable effect with the minimum of energy. It was an entirely novel arrangement of conductors and it made wireless telegraphy really practical for the first time.

The coherer is the part to which the description " electric eye " was applied. It consists of a small tube containing metal filings, which have the peculiar property of allowing a current of electricity to pass through them only when they are under the influence of an electric wave. When an electric wave, such as is set up by a thunderclap or an electrical discharge artificially produced, strikes the filings, they " cohere," in a molecular sense, and allow the current to pass. The passage of the current constitutes a signal, as it can be used to make a click in a telephone or to work a telegraphic tape-machine or other recorder.

Latterly, the distances of transmission have grown, wireless installations have become more complicated, and various refinements have been introduced. But the garden experiments at Pontecchio supplied the germ which was destined to grow, twelve years later, into the realisation of trans-Atlantic wireless telegraphy.

In 1896, Mr. Marconi came to England, took out his first patent for wireless telegraphy, and brought his apparatus under the notice of Sir William Preece, then Engineer-in-Chief to

the General Post Office. Sir William was keenly interested in Mr. Marconi's method, since he himself had experimented, upon quite different lines, in signalling across space. Sir William's method was based on the well-known fact that currents passing in an electric circuit induce currents in a parallel circuit. By stretching wires on opposite sides of narrow channels Sir William was able to bridge over the gap by means of this electro-magnetic induction. But the scope for that means of wireless telegraphy was extremely limited owing to the length of wire needed on each side to communicate even a short distance; and Sir William was quick to recognise that Mr. Marconi's use of Hertzian waves opened up new and unexpected possibilities.

Early in June, 1897, Sir William lectured before the Royal Institution on "Signalling through space without wires," and spoke of Mr. Marconi's achievements as follows:

> "In July last Mr. Marconi brought to England a new plan. Mr. Marconi utilises electric or Hertzian waves of very high frequency. He has invented a new relay which, for sensitiveness and delicacy, exceeds all known electrical apparatus. The peculiarity of Mr. Marconi's system is that, apart from the ordinary connecting wire of the apparatus, conductors of very moderate length only are needed, and even these can be dispensed with if reflectors are used.

He has not discovered any new rays; his receiver is based on Branly's coherer. Columbus did not invent the egg, but he showed how to make it stand on its end, and Marconi has produced, from known means, a new electric eye more delicate than any known electrical instrument, and a new system of telegraphy that will reach places hitherto inaccessible. . . . Enough has been done to prove and show that for shipping and lighthouse purposes it will be a great and valuable acquisition."

During the twelve months preceding Sir William's lecture, that is to say, between June 1896, and June, 1897, Mr. Marconi had conducted several experiments under the supervision of the Post Office, the War Office, and the Admiralty. Tests were first made successfully between St. Martin's-le-Grand and the Thames Embankment; but the experiments which first roused the authorities and the public to the importance of the invention were those carried out on Salisbury Plain, when Mr. Marconi covered a distance of four miles. In May, 1897, a series of demonstrations were made across the Bristol Channel, communication being established between Penarth and Brean Down, a distance of nearly nine miles.

As a matter of course, the interest taken in these demonstrations was nowhere keener than in Germany. Among those who witnessed the

Bristol Channel experiments was Professor Slaby, of the famous Charlottenberg School. He himself had been attempting to utilise Hertzian waves for signalling purposes, and the result of his visit to England is recorded in the following historic passage from an article he wrote for the *Century Magazine* :

"In January, 1897, when the news of Marconi's first successes ran through the newspapers, I myself was earnestly occupied with similar problems. I had not been able to telegraph more than one hundred metres through the air. It was at once clear to me that Marconi must have added something else—something new—to what was already known, whereby he had been able to attain to lengths measured by kilometres. Quickly making up my mind, I travelled to England, where the Bureau of Telegraphs was undertaking experiments on a large scale. Mr. Preece, the celebrated Engineer-in-Chief of the General Post Office, in the most courteous and hospitable way, permitted me to take part in these ; and in truth, what I there saw was something quite new. Marconi had made a discovery. He was working with means, the entire meaning of which no one before him had recognised. Only in that way can we explain the secret of his success. In the English professional journals an attempt has been made to deny novelty to the method of Marconi. It was

urged that the production of Hertz rays, their radiation through space, the construction of his electrical eye—all this was known before. True ; all this had been known to me also, and yet I never was able to exceed one hundred metres.

" In the first place, Marconi has worked out a clever arrangement for the apparatus, which, by the use of the simplest means, produces a sure technical result. Then he has shown that such telegraphy (writing from afar), was to be made possible only through, on the one hand, earth connection between the apparatus, and, on the other hand, the use of long extended upright wires. By this simple, but extraordinarily effective method, he raised the power of radiation in the electric forces a hundredfold."

Professor Slaby afterwards became one of Mr. Marconi's competitors, being a partner in the Slaby-Arco system which was adopted by the German Government, but he has probably never ceased to appreciate the debt he owed to the demonstration of Mr. Marconi's success in a field where he himself had been baffled.

Continuing his experiments, Mr. Marconi, in July, 1897, under the auspices of the Italian Government, transmitted messages between warships at Spezia, twelve miles apart. Shortly afterwards, he erected stations at Alum

Bay in the Isle of Wight, and at Bournemouth (subsequently removed to Poole), fourteen miles distant from Alum Bay, over sea. Many important experiments were made between these two stations, which were visited by several notable people, including Lord Tennyson and Lord Kelvin, the latter signifying his appreciation of the commercial possibilities of the service by paying for wireless telegraphic messages sent by him to Sir William Preece at the General Post Office, and others.

By this time the system had reached the stage at which the fourth link in the chain of development was required. Capital was, of course, necessary to realise the commercial benefits of wireless telegraphy on a large scale—to manufacture the instruments and develop the business generally, and in July, 1897, the Wireless Telegraph and Signal Company, Limited, was formed, to acquire Mr. Marconi's patents in all countries except Italy and her Dependencies. Mr. Marconi made a special arrangement with Italy in return for the substantial and enthusiastic assistance rendered to him by the Italian Government. Subsequently the name of the company was altered to Marconi's Wireless Telegraph Company, Limited.

For some time, the company had to continue the laborious pioneering work undertaken by Mr. Marconi. But it is interesting to survey the advance that had already been made since Mr. Marconi sent his first signals

over distances of a few yards. The range had been increased from yards to miles ; the receiving apparatus was much more reliable and under much better control ; that is to say, it was less likely to respond to stray electrical disturbances in the atmosphere and more likely to respond solely to the impulses intended to operate it. Mr. Marconi had proved that wireless telegraphy could be worked as well by night as by day, in fogs and storms as in fair weather, and that high hills or other obstructions did not prevent communication. It had also been shown that the apparatus was not costly and could be set up and handled by the ordinary telegraphist.

Very early in his experiments Mr. Marconi discovered that wireless signalling was most easily carried out across stretches of sea. As it was precisely in such circumstances that ordinary telegraphic communication was least adequate, the sea was clearly the natural sphere of wireless telegraphy. The earliest demonstrations of its real practicability were, therefore, made around the shores of the British Isles.

In May, 1898, at the request of Lloyd's Corporation, who thus early realised the great possibilities of wireless telegraphy, Marconi apparatus was installed at Ballycastle and Rathlin Island, in the North of Ireland. The distance between the stations was $7\frac{1}{2}$ miles, of which four were over land, and the remainder across the sea, a high cliff intervening between

the two positions. Uninterrupted communication between these two stations was maintained for some considerable time. The apparatus was worked part of the time by Lloyd's lighthouse keepers, who were not long in learning how to use the instruments.

In July of the same year the Marconi Company was requested by a Dublin paper (the *Daily Express*) to report, from the high seas, the result and incidents of the Kingstown Regatta. For this purpose a land station was erected in the grounds of the Harbour Master at Kingstown, and the steamer *Flying Huntress* was chartered, the Marconi instruments being placed in the cabin. A telephone was fixed from the land station at Kingstown to the *Express* Office in Dublin, and as the messages came from the vessel they were telephoned to Dublin and published in succeeding editions of the evening paper. The system was in use for several days, and over 700 messages were sent and received between the *Flying Huntress* and the land station, none requiring to be repeated.

On the 3rd of August, 1898, wireless telegraphic communication was established between the Royal Yacht *Osborne*, and Osborne House, Isle of Wight, in order that her late Majesty Queen Victoria might communicate with His Royal Highness the Prince of Wales (King Edward VII.), suffering from the results of an accident to his knee. Constant and uninterrupted communication was maintained

between the Royal Yacht and Osborne House, during the sixteen days the system was in use. One hundred and fifty messages were sent, being chiefly private communications between the Queen and the Prince. Many of these messages contained over 150 words, and the average speed of transmission was about fifteen words per minute.

In December, 1898, the Marconi Company considered it desirable to demonstrate the practicability of the system for communication between lightships and the shore, and the opportunity was offered to the company by the officials of Trinity House. They gave permission for connection to be made between the South Foreland Lighthouse and either the *Gull*, the *South Sandhead*, or the *East Goodwin* Lightship. The vessel chosen was the most distant one, viz., the *East Goodwin*, which is twelve miles from the South Foreland Lighthouse. The apparatus was taken out to the lightship in an open boat, rigged up in one afternoon, and set to work immediately, without the slightest difficulty. The system continued to work admirably through the whole time it remained in use—over two years—and it was the means of saving several vessels and a number of lives. In the case of one steamer, which went ashore on the Goodwins, evidence in the Admiralty Court proved that by means of one short wireless message, property to the value of £52,588 was saved.

During a heavy gale in January, 1899, when

a part of the bulwarks of the *East Goodwin* Lightship was carried away, a report of the mishap was promptly telegraphed to the Superintendent of Trinity House with all details of the damage sustained. On the 3rd of March the same year, the lightship was run into by the sailing ship R. M. *Matthews*. The incident was reported by wireless to the South Foreland Lighthouse, lifeboats were promptly launched, and the lightship was towed out of danger.

Dr. Fleming, after spending some time in examining the appliances and working, wrote a letter to *The Times*, on the 3rd April, 1899, which gives a very graphic account of the achievements of wireless telegraphy at this period. The following are some extracts :

> " During the last few days, I have been permitted to make a close examination of the apparatus and methods employed by Signor Marconi in his remarkable telegraphic experiments between South Foreland and Boulogne, and at the South Foreland Lighthouse have been allowed by the inventor to make experiments and transmit messages from the station there established, both to France and to the lightship on the Goodwin Sands, which is equipped for sending and receiving ether wave signals. Throughout the period of my visit, messages, signals, congratulations, and jokes were freely exchanged between the operators sitting on either side of the Channel, and automatically

printed down in telegraphic code signals on the ordinary paper slip at the rate of twelve or eighteen words a minute. Not once was there the slightest difficulty or delay in obtaining an instant reply to the signal sent.

"The apparatus, moreover, is ridiculously simple and not costly. With the exception of the flagstaff and 150 feet of vertical wire at each end, he can place on a small kitchen table the appliances, costing not more than £100 in all, for communicating across thirty, or even a hundred miles of channel. With the same simple means, he has placed a Lightship on the Goodwins in instant communication, day and night, with the South Foreland Lighthouse. A touch on a key on board the Lightship suffices to ring an electric bell in the room at the South Foreland, twelve miles away, with the same ease and certainty with which one can summon the servant to one's bedroom at an hotel. An attendant now sleeps hard by the instrument at South Foreland. If, at any moment, he is awakened by the bell rung from the lightship, he is able to ring up in return the Ramsgate lifeboat, and, if need be, direct it to the spot where its services are required, within a few seconds of the arrival of the call for help. In the presence of the enormous practical importance of this feat alone, and of the certainty with which communication can now be established between

ship and shore, without costly cable or wire, the scientific criticisms which have been launched by other inventors against Signor Marconi's methods have failed altogether in their appreciation of the practical significance of the results he has brought about.

"Up to the present time none of the other systems of wireless telegraphy employing electric or magnetic agencies has been able to accomplish the same results over equal distances. Without denying that much remains yet to be attained, or that the same may not be effected in other ways, it is impossible for any one to witness the South Foreland and Boulogne experiments without coming to the conclusion that neither captious criticism nor official lethargy should stand in the way of additional opportunities being afforded for a further extension of practical experiments. Wireless telegraphy will not take the place of telegraphy with wires. Each has a special field of operations of its own, but the public have a right to ask that the fullest advantage shall be taken of that particular service which ether wave telegraphy can now render in promoting the greater safety of those at sea, and that, in view of our enormous maritime interests, this country shall not permit itself to be outraced by others in the peaceful contest to apply the outcome of scientific investigations and discoveries in every possible direction to the service of those who are obliged to face

the perils of the sea. If scientific research has forged a fresh weapon with which in turn to fight Nature, 'red in tooth and claw,' all other questions fade into insignificance in comparison with the inquiry how we can take the utmost advantage of this addition to our resources."

The Marconi apparatus was eventually removed from the lightship, as the Board of Trade was not at that time prepared to enter into a contract with the company.

Naturally enough, most of Mr. Marconi's attention was directed to increasing the range of transmission. He found that by raising his aerial masts he could send his messages farther, but there was a limit to the practicable height of masts on land as well as on sea. Accordingly he devised, about this time, an improvement which made the receiver very much more sensitive than it had been. This improvement enabled the receiver to record messages much farther away from the source of the waves. The results obtained with it encouraged Mr. Marconi to attempt to communicate across the English Channel. Success was achieved in 1899, between the South Foreland and Boulogne stations referred to by Professor Fleming in the letter quoted above, the distance between these two stations being thirty-two miles.

Nothing in the previous history of wireless telegraphy roused such keen interest as the

bridging of the Channel. It set the scientific world talking and filled the newspapers with descriptions, comments, and prophecies. In August, 1899, the British Association held its meeting at Dover ; and during a lecture to the Association on " The Centenary of the Electric Current " (Volta had made his famous discovery of the Voltaic Cell in 1799), Professor Fleming exchanged messages between a temporary station in the lecture hall and the South Foreland, Wimereux (Boulogne), and the East Goodwin Lightship—4, 33, and 12 miles distant respectively.

The next step was the transmission of messages between Wimereux and Chelmsford, a distance of 85 miles, 30 over sea and 55 over land.

The feasibility of wireless telegraphy over land was also demonstrated by experiments between the Chelmsford Station and the one at Harwich, forty miles distant.

In November, 1899, a number of Marconi installations were despatched to South Africa, at the request of the War Office, but owing to the difficulties of procuring suitable masts at the front, it was decided to transfer them to the Navy Squadron in Delagoa Bay, where they were used to such advantage that the Admiralty decided to make its first purchase of thirty-two sets from the company.

The Admiralty from the outset had been watching the progress of the experiments with

interest. In August, 1899, the first attempt was made to use the new method of signalling during naval manœuvres. Three ships of the "B" fleet—the flagship *Alexandra*, and the cruisers *Juno* and *Europa*—were fitted with wireless apparatus. Attached to the *Juno* was a small squadron of cruisers; and the method adopted was that messages sent to the *Juno* from the flagship by wireless telegraphy were repeated to the cruisers by the usual flag signalling. This arrangement enabled the flagship to control the movements of the squadron even when out of sight. The wireless installations were kept going night and day with results which convinced the Admiralty that wireless telegraphy was invaluable as an aid to manœuvres on a large scale. The greatest distance covered during these trials was 74 nautical miles—equivalent to 85 land miles.

In October of the same year the Marconi system was used to report from the high seas the progress of the yachts *Shamrock* and *Columbia* in the International Yacht Race. Over 4000 words were transmitted in the space of less than five hours spread over several days. After the conclusion of this race some tests were carried out by the United States Government, the apparatus being fitted on the battleship *Massachusetts*, and the cruiser *New York*.

A beginning was also made during this eventful year with the "ocean newspapers,"

which are now familiar to travellers by the great liners. Shortly after the outbreak of the South African War, Mr. Marconi was returning from the United States on board the American liner *St. Paul*, and as he had a set of apparatus with him, it was suggested that it should be fitted up in the ship in an attempt to establish communication with Mr. Marconi's installation at the Needles, Isle of Wight, and obtain the latest war news before the arrival of the *St. Paul* at Southampton. This was accordingly done, and the *St. Paul* succeeded in calling up the Needles station at a distance of sixty-six nautical miles. All the important news was transmitted to the *St. Paul*, while she was steaming 20 knots, and messages were also despatched to several places by passengers on board. The news was collected and printed in a small paper called the *Trans-Atlantic Times*, several hours before the vessel arrived at Southampton.

In March, 1900, the Marconi system was adopted by the Norddeutscher Lloyd Steamship Company, and by agreement with that company the Marconi apparatus was installed on the *Kaiser Wilhelm der Grosse*, on the *Borkum Riff* Lightship, and at the Borkum Lighthouse. According to the official report of the Imperial Postal Authorities at Oldenburg the total number of commercial wireless telegrams transmitted from and to the *Borkum* Lightship between the 15th May and the end of October, 1900, amounted to 565. Of these,

515 came from ships at sea, and 47 were for transmission to ships. There are now 17 vessels of the Norddeutscher Lloyd equipped with Marconi apparatus.

In November, 1900, the Belgian Royal Mail Steam Packet *Princesse Clementine*, plying between Ostend and Dover, was equipped with wireless telegraphy, and a Marconi station was installed at La Panne, near Ostend, on the Belgian coast. These installations have frequently proved of great value in saving life and property. On New Year's Day, 1901, the barque *Medora* was stranded, waterlogged, on the Ratel Bank. The *Princesse Clementine* which happened to pass near, at once sent a message to Ostend through the La Panne Station, and before leaving was able to tell the shipwrecked sailors that assistance was on the way.

Shortly afterwards, upon coming into signalling distance of the Roytengen Lightship, about 15½ miles from Dunkirk, the captain of the *Princesse Clementine* observed that he was being signalled. It appeared that the lighting apparatus of the lightship was out of order. The captain of the mail packet at once despatched a message via the La Panne station, to the Lighthouse Department at Dunkirk, which immediately sent out to the lightship and effected the necessary repairs. The great inconvenience and danger of the lightship not being able to have its lights exhibited was thus avoided.

Considerable use was also made of the Marconi system in the British cruisers attached to the *Ophir* during the voyage of the Duke and Duchess of Cornwall to Australia in 1901.

Thus ends what we may term the early history of the Marconi System of Wireless Telegraphy.

Arms of Fiji.

CHAPTER VIII

THE GROWTH OF THE WIRELESS MARITIME SERVICE

The prominent position held by the Marconi Company in wireless telegraphy is primarily due to the remarkable skill and inventiveness of Mr. Marconi, but it is also due, in no inconsiderable degree, to the commercial policy adopted by the company.

The Marconi Company was the first—and for many years the only company in the world—to organise a public business in the transmission of messages by wireless telegraphy. This is a very important point. The Marconi Company began—as other wireless telegraph companies began and continued—by simply manufacturing wireless apparatus, and selling it outright to shipowners and others who wanted to use it. This was done, for instance, in the case of the installations supplied to the *Kaiser Wilhelm der Grosse*, and to the Dover-Ostend packet boats. It soon became clear to the Marconi Company, however, that no satisfactory or extensive business could be done by asking shipowners to purchase apparatus outright, and to organise a public service. The company accordingly decided to adopt the

bold policy of organising the service on its own account.

Three things were necessary to the efficiency of such a service. First, the provision of land stations adjacent to the chief trade routes; second, the equipment of vessels with wireless apparatus, and, third, but by no means least, the working of both ship and shore stations by operators trained to obey the same rules and regulations. These are the lines upon which the Marconi Company rapidly built up a most useful and successful service on the high seas. In each case the apparatus installed on the ships remained the property of the company, and was worked by the company's own operators. With uniform control confusion was prevented and the service brought to the highest pitch of usefulness.

In order to carry out this pioneering work the Marconi International Marine Communication Company, Limited, was formed in 1900. It is empowered to work the Marconi system for maritime purposes everywhere except in the United States and its Colonies, Hawaii, and Chili. In Great Britain and Italy the licence does not extend to naval vessels.

At this period it was open to any one to erect a wireless telegraph station anywhere in the British Isles to communicate with a ship outside the three-mile limit reserved by the Postmaster-General under his power of monopoly. No licence of any kind was then required for this class of enterprise. The Marconi

Company at once proceeded to erect stations, and in May, 1901, the following were open for commercial telegraphic communication with ships at sea :

In Ireland : Crookhaven, Malin Head and Rosslare.

In England : Holyhead, Withernsea, Caister, Lizard, Niton (Isle of Wight), and the North Foreland.

The first British ship to be fitted with wireless telegraphy under this system was the Beaver Line steamship *Lake Champlain*, in May, 1901. The organisation was soon widely extended by agreement with the Italian, Canadian, Belgian and Newfoundland Governments. In 1901 a fourteen years' contract was entered into with the Corporation of Lloyds, providing for the installation of Marconi apparatus in ten of Lloyd's signal stations. The result was that Marconi Telegraphy soon established itself over a large portion of the globe, and is now an important factor in civilisation. Installations have been set up, not piecemeal, but on a comprehensive system, which resembles very nearly a telephone system, of which the ships are the subscribers and the shore stations the exchanges.

It was not long before other shipowners took advantage of the wireless exchange offered to them. The Cunard Company, as befitted one of the oldest, and at the same time most enterprising shipping companies, was amongst the first to adopt the system in their largest

Atlantic liners ; and early in 1902, an agreement was made with the Belgian Government for the installation of the apparatus on all the Ostend-Dover Royal Mail Steam Packets.

While this growth in organisation was proceeding, Mr. Marconi was rapidly improving the range and certainty of transmission. The distance over which messages could be sent at sea rose from tens to hundreds of miles, and later—when the long-distance stations at Poldhu and Cape Cod were established—to over 1000 miles. The isolation of ocean voyages on the great liners thus became a thing of the past. Messages could be received at any time from the stations on one side or other of the Atlantic, and from any of the vessels passing within a hundred or two hundred miles.

This development led to the establishment in June, 1904, of a regular news service on board the Atlantic liners—following the plan adopted on the *St. Paul*, at the outbreak of the South African War. The Cunard liner *Campania* was the first vessel to be equipped with long-distance receiving apparatus which enabled messages to be recorded over 1000 miles from the sending station. Other liners soon followed suit ; and the regular items of news transmitted from the English, American, and Canadian long-distance stations were published day by day in the *Cunard Bulletin*.

Trans-Atlantic Wireless Telegraphy. — In 1900—that is to say, five years after he had made his first experiments in the garden at

Pontecchio—Mr. Marconi had raised the range of transmission by wireless telegraphy to over 200 miles. It was inevitable, therefore, that he should expect to increase the range still farther and to bridge the Atlantic as he had bridged the Channel.

Pessimistic prophets were not slow to declare such a feat to be impossible. They confidently predicted that the curvature of the earth would prevent the electric wave from England being detected in America, unless the aerials from which the waves were despatched exceeded several miles in height. They also declared that the tremendously powerful waves from the long-distance station would swamp the feebler waves from the ordinary ship and shore station, just as thunder drowns the noises of everyday life.

Taking the latter point first, Mr. Marconi had good reason for believing that the prophets were mistaken. He had already developed his " tuning " or syntonic system so far that he felt sure the traffic between ship and shore stations would not be disturbed by the thunders of his long-distance stations. His earliest receiving instruments had been sensitive to practically every kind of electric wave ; but his later instruments were designed to respond only to waves of a certain amplitude. A tuning fork will start vibrating if an exactly similar tuning fork in its vicinity is struck, but it will not resonate even to a thunder-clap, unless the note of the clap is of the proper pitch. A

similar power of selection is enjoyed by the tuned or syntonic wireless apparatus. Mr. Marconi proved that the long-distance station at Poldhu could send messages to a Cunard liner several hundreds of miles out at sea, without affecting the messages sent from a neighbouring station to a ship approaching Southampton water.

As regards the obstacle presented by the curvature of the earth, that proved to be a bogey, like Professor Airy's famous pronouncement, fifty years ago, that an Atlantic cable could never be laid, and, if laid, could never be used for the transmission of electric signals.

Mr. Marconi convinced himself, by tests made between two stations two hundred miles distant, that the electric waves he was employing were able to make their way round the curvature of the earth. He concluded that the curvature of the earth was not likely to constitute a barrier to the transmission of the waves over great distances. In 1900, therefore, experiments in trans-Atlantic transmission were begun in earnest at Poldhu. Shortly afterwards the erection of a similar trans-Atlantic station was begun at Cape Cod in the United States of America.

Towards the end of 1901 the station at Poldhu was far enough advanced to try the experiment of transmitting signals right across the ocean. The completion of the arrangements was, however, delayed owing to a storm which wrecked the masts and aerial at Poldhu,

on 18th September, 1901. Nevertheless, by the end of November the aerial was sufficiently restored to enable Mr. Marconi to complete the preliminary tests which he considered necessary prior to making the first experiment across the Atlantic.

Another accident—in this instance to the masts at Cape Cod, on the 24th November, 1901—seemed likely to postpone the tests for several months more. Mr. Marconi therefore decided that in the meantime he would use a purely temporary receiving installation in Newfoundland for the purpose of testing how far the arrangements in Cornwall had been conducted on right lines. He accordingly left for Newfoundland on 27th November, 1901, with two assistants. As it was impossible at that time of the year to set up a permanent installation with poles, Mr. Marconi decided to carry out the experiments by means of receivers connected to elevated wires supported by balloons or kites—a system which had been previously used by him when conducting tests across the British Channel for the Post Office in 1897. He also employed a telephonic receiver which registered the messages by means of a series of clicks.

Mr. Marconi's assistants at Poldhu had received instructions to send on and after the 11th of December, during certain hours every day, a succession of " S's," followed by a short message. In the Morse code the letter " S " is represented by three successive dots.

On December 12th, the signals transmitted from Cornwall were clearly received at the pre-arranged times, in many cases a succession of "S's," being heard distinctly, although probably in consequence of the weakness of the signals and the constant variations in the height of the receiving aerial no actual message could be deciphered.

The result obtained, although achieved with very imperfect temporary apparatus, was sufficient to convince Mr. Marconi that by means of permanent stations (that is, stations not dependent on kites or balloons for sustaining the elevated conductor—and by the employment of more power in the transmitters it would be possible to send messages across the Atlantic Ocean with the same facility with which they were being sent over much shorter distances.

In February, 1902, further tests were carried out between Poldhu and a receiving station on board the American liner *Philadelphia*, *en route* from Southampton to New York.

Readable messages were received from Poldhu up to a distance of 1551 miles; "S's" and other test letters were detected as far as 2099 miles.

The distances at which the messages were received were all verified and countersigned by the captain and chief officer of the ship, who were present during the tests.

Early in 1902 modifications and improvements were carried out at Poldhu, wooden

towers being erected to replace the masts, and at the same time a high-power station was commenced at Cape Breton (Nova Scotia) to enable Mr. Marconi to carry out further tests. These tests were greatly facilitated by the subsidy of £16,000 granted by the Canadian Government to support Mr. Marconi's experiments.

During the time that constructional work was in progress at Glace Bay, Cape Breton, tests from Poldhu were carried out over considerable distances, the Italian Government very kindly placing the cruiser *Carlo Alberto* at Mr. Marconi's disposal for this purpose.

During these tests messages were received direct from Cornwall by the *Carlo Alberto*, in the Baltic, the North Sea, the Bay of Biscay ; also at Ferrol, Kiel, Cadiz, Gibraltar and Spezia.

After these experiments the *Carlo Alberto* was sent back from the Mediterranean to Plymouth and thence conveyed Mr. Marconi to Canada, in October, 1902. Signals from Poldhu were received throughout the voyage up to a distance of 2300 miles. In December, 1902, messages were for the first time exchanged at night between the stations at Poldhu and Glace Bay. Trans-Atlantic wireless telegraphy was then a definitely accomplished fact. It was found, however, that communication was exceedingly difficult and unreliable from England to Canada, whilst it was good in the opposite direction. The reason for this is that Glace

Bay station was equipped with more powerful and more expensive machinery, a condition rendered possible by the subsidy granted by the Canadian Government.

As, however, communication had been established by wireless telegraphy from Canada to England, inaugural messages were despatched to the Sovereigns of England and Italy, both of whom had previously given Mr. Marconi much assistance and encouragement in his work. Their replies attested their appreciation of the results which had been achieved. Other messages were also sent to England by the Government of Canada. Officers delegated by the Italian Government and a representative of the London *Times* were present at the transmission of these messages.

Further tests were shortly afterwards carried out with the other long-distance station at Cape Cod in the United States of America. A message from President Roosevelt was transmitted from that station to His Majesty the King in London.

In the spring of 1903, the transmission of news messages from America to the London *Times* was attempted in order to demonstrate that messages could be sent from America by means of the new method ; and for a time these messages were correctly received and published. A breakdown in the insulation of the apparatus at Glace Bay made it necessary, however, to suspend the service ; and unfortunately further accidents made the transmission of messages

uncertain and unreliable. In consequence it was decided not to attempt, for the time being, the transmission of any more public messages until a reliable service could be maintained in both directions under all ordinary conditions.

As Mr. Marconi found that many improvements evolved during the course of the numerous tests and experiments could not be readily applied to the plants at Poldhu and Cape Breton, it was decided to erect a completely new long-distance station in Ireland, and to transport the one at Glace Bay to a different site in the vicinity, where sufficient land was available for experimenting with aerials of much larger dimensions than had been previously employed.

Experiments were, however, continued at Poldhu. In October, 1903, it became possible to supply the Cunard steamship *Lucania* with news transmitted direct from the shore during the entire crossing from New York to Liverpool.

In November of the same year tests, similar to those carried out with the Italian cruiser, took place on behalf of the British Admiralty, between Poldhu and H.M.S. *Duncan*. Communication with Poldhu was maintained during the entire cruise of this battleship from Portsmouth to Gibraltar, and further communication was established between Poldhu and the Admiralty station situated on the Rock of Gibraltar. The distance between Cornwall and Gibraltar is 1000 miles—500 over land and 500 over water.

Early in 1905 the construction of the new station at Glace Bay was sufficiently advanced to allow of preliminary tests being carried out. Signals and messages from this station were received at Poldhu by day as well as by night, but no commercial use of the station was made at that time, because the corresponding station on the same plan had not yet been erected in Ireland. In October, 1905, however, preparations were made for the construction of a trans-Atlantic station near Clifden, in Galway. Considerable delays were experienced in the course of the work, and it was not until the end of May, 1907, that the station was ready for experiments with Glace Bay.

Good signals were obtained at Glace Bay from the very commencement of the tests, but some difficulty was encountered in consequence of the effects of atmospheric electricity, due to the prevalence of thunderstorms in the eastern parts of Canada, during the first few days of the tests.

Simultaneously with these tests others were carred out from Poldhu to Glace Bay with a new system of transmitting apparatus. The signals from Poldhu were so much better than those from Clifden that Mr. Marconi decided at once to adopt this new method of transmission at Clifden and Glace Bay. A few tests with this apparatus were carried out between Glace Bay and Clifden, and on October 17th, 1907, a limited service for Press messages was commenced between Great

Britain and America. On February 3rd, 1908, this service was extended to ordinary messages between London and Montreal.

Considering the novelty and the peculiar difficulties of such an enterprise, the time occupied in establishing a wireless telegraph service across the Atlantic was by no means excessive. It was, indeed, remarkable that success was achieved in so short a time. Numerous problems had to be solved *ambulando*, and many entirely new devices had to be erected at considerable expense before the efficacy could be determined. An important novelty introduced at both Glace Bay and Clifden was the "directional aerial." By arranging the aerial wires in a peculiar way Mr. Marconi was able to concentrate the electric waves mainly along the direct path between the two stations. This arrangement secured more certain transmission with a smaller expenditure of power, while limiting the area of possible disturbances with or by other wireless stations.

The "broadcast" character of Marconi telegraphy is at once its advantage and disadvantage in comparison with the cable. It is a great advantage for certain reasons, for example for Press messages, to be able to telegraph to all points of the compass simultaneously. It is a disadvantage on the other hand that the messages should lack secrecy, and not be dirigible when desired to any particular region or point. Moreover, much uncertainty and

irregularity has been caused in wireless operations by electric disturbances or "atmospherics," these having been especially prevalent in the West Indies.

Science might be relied upon to mitigate these defects, so far as is physically and humanly possible, and Senatore Marconi was able to make an interesting statement at the annual meeting of his company on December 3rd, 1923. In fact, the great inventor foreshadowed what seemed likely to be an entirely new system of long-distance communication, or at any rate to involve a great change in the methods hitherto employed for communication by wireless with distant countries.

According to this system, the electric waves which carry the messages are projected and propagated in a beam in any desired direction only, instead of being allowed to spread around in all directions.

The advantages of the new method are at least fourfold, because :

First : Owing to the better utilisation and concentration of power a much smaller amount of electrical energy need be employed for a given distance, resulting in a substantial economy in capital and in working expenses.

Second : Only stations inside a certain restricted angle or sector are enabled to receive, and this increases the privacy and secrecy of communication, besides greatly reducing the possibility of mutual interference with other stations.

Third : Owing to the employment of comparatively short waves the speed of transmission and reception can be several times greater that what is attainable with existing long-distance systems.

Fourth : The disturbances caused by the effect of atmospheric electricity are greatly minimised.

During the tests communication was successfully carried out on this system between England and many places abroad, including St. Vincent (Cape Verde Islands), up to a distance of 2250 nautical miles, by the employment of only a fraction of the electrical energy hitherto found necessary to cover such distances. There is little doubt that the system will ultimately be practicable for communication to the farthest distances.

In point of fact, there seems to have been nothing quite new in this development. In 1888, Hertz had used parabolic reflectors for sending short waves in roughly defined beams the length of his laboratory. This apparatus was made more sensitive by Marconi and used on Salisbury Plain in 1896 or 1897, over a distance of two miles. As modern methods of generating waves become more powerful and improvements in the receivers make them more sensitive, the possibilities of the parabolic reflection method become greater. Experiments are being made in several countries. It should be noticed that when we speak of a " beam," we do not mean, as some people seem to think,

something as fine as a wire or a rope. The beam will be at least 200 miles wide by the time it gets across the Atlantic, and, of course, anybody along its path can pick it up. All the same the development is one of great and important possibilities.

Considering that wireless telegraphy is still so young, the remarkable advance which it has made during this short period will discourage any attempt to fix limits to its application. Already it has become a vital aid to the safety of shipping and an instrument of ever-increasing value to commercial and social life. It has provided a new factor in offensive and defensive warfare ; and it has, generally, opened up the prospect that communication between nations will become much more cheap and easy than at present.

As time goes on, more and more ships of the mercantile marine will be equipped with wireless telegraphy, until such installations become recognised as necessary to the safety and up-to-date working of a ship. Parallel with this development there is certain to be an increase in the number of installations on land and on lightships, lighthouses, and other points of importance to the safety of shipping.

In the British Navy, every battleship and cruiser is fitted with Marconi apparatus, and the service has recently been extended to destroyers. The rapid and carefully planned evolutions over an extended area—characteristic of modern naval warfare—would hardly

be possible without the power of communication by wireless telegraphy. In military operations also wireless telegraphy is being more largely used. The Marconi Company has designed portable apparatus for this purpose, capable of being carried on horseback or in carts, which can be set up in from ten minutes to half an hour after arrival at the site.

For inland telegraph work wireless telegraphy has already been used to a considerable extent by the Italian Government, and in the case of two sets of experimental stations, by the British Post Office. Marconi apparatus was installed at Tobermory and Loch Boisdale, for the handling of ordinary telegraphic business, and the results have been so satisfactory, that a station has recently been erected at Bolt Head in Devonshire, which is considered to be one of the best equipped small power stations in existence. It has a range of 300 miles, and has been opened by the British Post Office for a public telegraph service with ships at sea. Wireless stations will probably be used a great deal in situations where the hills, deep channels or the prevalence of storms make the use of land lines difficult.

Commercial trans-Atlantic communication having been established with so much success, it is bound to develop rapidly in usefulness. As to how far the wireless service will compete with the cable service in the immediate future views greatly differ, but the general trend of independent opinion seems to be that the

wireless service will create much more new traffic for social and Press purposes, than it will take from the cables. In other words, wireless and cable telegraphy will be co-operative rather than competitive.

In 1903, when the immense importance of wireless telegraphy in maritime and general international affairs began to be realised, the Emperor of Germany invited the other great powers to a preliminary conference to consider the question of international control. Great Britain sent delegates to that conference, but it was unable to subscribe to the resolutions for supervising wireless telegraphy, since at that time the government had not assumed powers to control wireless telegraphy within its own territory. In 1904, however, the Wireless Telegraphy Act was passed, making it compulsory upon any one desiring to erect and work a wireless station in the British Isles, to apply to the Postmaster-General for a licence. When, in 1906, a second International Conference was held, Great Britain agreed with all the other great Powers, with the exception of Italy, that wireless telegraph stations on land and on sea should be subject to certain international regulations, and that each station must receive and transmit all messages irrespective of the system adopted by the station which is sending the messages to it, or is intended to receive the messages. The Select Committee of the House of Commons, which was appointed to consider the advisability of

Great Britain ratifying this Convention, reported in favour of it, and recommended that, in recognition of the valuable work already done by the Marconi Company as the pioneers of practical wireless telegraphy, the company should be compensated in the event of its business being injuriously affected by the operation of the Radiotelegraphic Convention.

The establishment of government supervision is perhaps the highest compliment which could be paid to wireless telegraphy. It represents the desire of other nations to secure for their own benefit the results of enterprise conducted by Mr. Marconi with the cordial support of the Italian, Canadian and British Governments.

The business of the Marconi Companies may be divided into three principal departments :

1. Trans-Atlantic Wireless Telegraphy.
2. Maritime or Ship-to-Ship and Ship-to-Shore Service.
3. Manufacture of Apparatus.

The first two of these have been already dealt with fully. In addition to the main departments the company undertakes, at its Liverpool station, the training of operators. This work was organised in pursuance of the policy of uniform control which the company adopted at the outset of its commercial career. No small amount of skill and intelligence is required to work wireless telegraphic apparatus on the high seas, but the conditions are favourable enough to attract a good class of operator

and there is no difficulty in securing a sufficient number of recruits. Over 500 wireless stations have been equipped by the company and the number is constantly being added to.

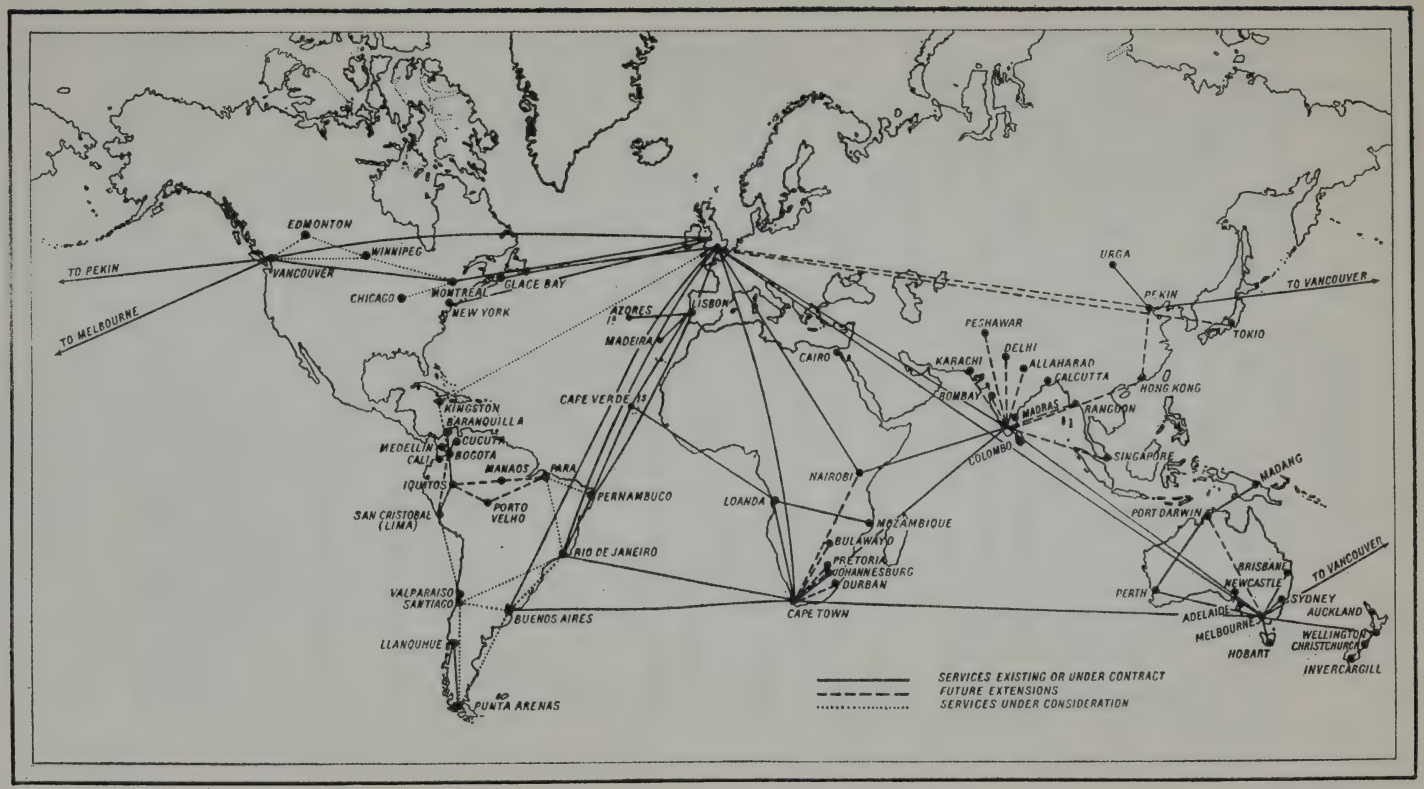
The scope of the company's operations is not confined to any particular country. In the most obvious application of wireless telegraphy, viz. for ship-to-shore communication, the Telegraph System comprises coast stations in many different countries, and stations on ships of many different nationalities. Ships voyaging, for example, from Germany to the United States require to communicate with stations in the United Kingdom, on the Continent of Europe, and on the coast of North America. Also communication takes place between the different liners at sea. It follows, therefore, that there must be uniformity, not merely of apparatus, but of method of working at all these stations. It was, therefore, considered advisable to have a number of companies associated together, which would constitute a world wide organisation for wireless telegraph purposes, and with this view certain affiliated companies have been established in other countries with which the parent company has intimate working relations.

CHAPTER IX

THE ALL-RED SYSTEM

The desirability of a wireless system covering the whole Empire with its stations on British territory was soon realised. The Empire cable system had grown up in a haphazard way, and even now there is no scientifically organised All-Red service. There was no reason, however, why "wireless" development should not be consciously directed from the start to the objective of a purely British system. This subject has been discussed since 1910, when the first scheme for linking up all parts of the Empire with the mother country was submitted to the government by the Marconi Company. Yet even at this date the important questions of ownership and control are not yet settled. On the one hand, the government has felt the necessity of the State having a direct share in a service, whose political implications are so important, and the need also of avoiding any exclusive monopoly which might be injurious to public interests. The evils of monopoly had already been felt in the cable services, and it was highly desirable that this experience should be applied in the organisation of wireless telegraphy and telephony.

On the other hand there was a powerful



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Wireless Chart (by the Marconi Company.)

company like the Marconi, anxious to sweep as much of the traffic into its own net as possible, anxious to pay dividends, and with every temptation to push the new services at the expense of the old, even though public interest might thereby be endamaged. How were these two points of view to be reconciled in the new arrangements? How were private and state enterprise to work together in making this new invention as widely available to all British subjects as possible?

The Marconi proposal in 1910 was that the company should be granted licences to erect stations in all the Dominions and Colonies for the purpose of conducting wireless telegraph services. This proposal was approved by the government, on condition that the State should be a partner with the company in the erection and working of the stations. Finally, an agreement was entered into in 1912, and ratified by Parliament in 1913, between the government and the company, under which six stations were to be erected in the first instance by the company, on behalf of the government, the company being interested therein.

As a result of this other countries began at once to follow suit.

In Germany two powerful stations were erected, and in their colonies stations were constructed in Togoland and at Windhuk, and Dar-es-Salaam, in West and East Africa respectively.

The Marconi Company in the meantime had obtained a licence for the erection of a station at Carnarvon for trans-Atlantic service between America and this country.

Under the terms of the contract the company started the erection of three of the government stations—one at Leafield, one in Egypt, and one in India.

The French Government equipped the Eiffel Tower with a powerful station, and built another at Lyons.

The Americans built stations in the vicinity of New York and at San Francisco and Hawaii for service between America and England, and America and Japan.

The company obtained a concession from the Argentine Government, and were making preparations to erect a station in Buenos Aires. This work was unable to proceed in consequence of the outbreak of war.

During the war the Americans built a high power station at Bordeaux, which was subsequently taken over by the French Government.

The Germans obtained a concession from the Argentine Government, and the Germans of South America subscribed substantial capital for the erection of that station in Buenos Aires.

The Japanese erected a powerful station at Tokio and commenced the building of a station in Peking. The company has agreed with the Japanese that this station shall be taken over and controlled by an English company.

After the war, the Germans increased the power of their stations and built a number of small stations throughout the country, opening up services with most European countries and with America.

The French gave a licence to private enterprise which has built a group of powerful stations at Sainte Assise from which they are to-day conducting services with America, the French Colonies, and other European countries.

The Americans built a powerful group of stations on Long Island, and are now conducting a number of European services besides a service across the Pacific. It may be mentioned that in America the telegraph services are free from all government control.

The war interrupted the movement towards an Imperial wireless chain, and the contract with the Marconi Company came to an end. After the war the government completed the station at Leafield near Oxford, whose broadcasted messages are picked up in India, and even Australia, and from which the Foreign Office despatches its bulletins, and Press messages are sent to American papers. It may be added that the government now possesses a smaller power station at Northholt which communicates with Newfoundland. The existing Marconi stations are at Carnarvon, which deals with trans-Atlantic messages and at Ongar in Essex communicating with Glace Bay in Cape Breton Island, with Spain and other parts of Europe.

But to return to the course of events in England. The Empire wireless chain was still the objective, and the government appointed committee after committee to report upon the subject. It is rather remarkable that while Great Britain was actually pioneering in wireless in foreign countries, her own scheme for a great British service badly hung fire.

The "Norman" scheme, called from Sir Henry Norman, Chairman of the Imperial Wireless Telegraphy Committee of 1919, which held the field for some time, provided for eight stations of 500 kilowatts each to be erected in England, Egypt, India, East Africa (Nairobi), South Africa, Singapore, Perth (W. Australia), and New Zealand. Canada was reserved for special consideration. There was also to be an offset to Hong-Kong.

Each of these stations would have been good for very great distances, say for six hours a day, for medium distances for twelve or fourteen hours, and for the whole twenty-four for the distances between one another. At the most favourable times England could communicate directly with Australia, but at the worst it would be necessary to get there along the stepping-stones of Cairo, India, Singapore, and Perth. The home government was to build the stations in England, Egypt, East Africa and Singapore, but India and the Dominions would undertake the cost of their own stations. The cost to the home government would have been no more than £850,000.

This scheme did not suit the interests of the Marconi Company, which opposed it largely for the reason that if the home station was big enough the intermediate stations were not necessary. Most persons will think these stations to be desirable, whatever the range of the home station may be, for communication *inter se*. But the scheme was wrecked, and the only relic of it is the home station in the course of erection at Rugby.

Meanwhile foreign countries were forging ahead in wireless construction, and securing the wave lengths suitable for long-distance wireless transmission, with the resulting danger to this country, that it might become difficult to obtain the wave lengths for the Imperial scheme within the usual waveband of from 10,000 to 26,000 metres.

The Imperial Conference of 1921 took up the "wireless" question in good earnest. There were long discussions and important resolutions passed, but the hopes of the Press and of the commercial interests which had been excited by this prominence of the subject at the conference were not justified.

Committees continued their investigations. The Wireless Telegraph Commission, which reported in 1922, admitted that direct communication was possible between England and India and England and Australia, over limited periods of the day, but held (it would seem quite rightly) that the intermediate stations

were still indispensable links in the Empire chain.

This policy was unexpectedly reversed in July, 1922 :

> " The Postmaster-General announced that the government had been convinced of the possibility of direct communication with all of the Dominions, and had decided to erect in England a station which would provide efficient direct commercial communication with India, South Africa, and Australia. As a result of this decision the erection of the " link " stations, which had been contemplated on the Suez Canal and in East Africa, would be deferred and the erection of stations at Singapore and Hong-Kong would be reconsidered."

But besides the technical and geographical questions involved, there was also a financial and political problem. Who was to build and own and control the stations ? The original intention of the government was that the stations should be owned and administered by the State. Some influential bodies, including the Empire Press Union and the Federation of British Industries urged the usual arguments against governmental and for private enterprise. These representations seem to have had their effect, for on March 5, 1923, Mr. Bonar Law, then Prime Minister, made a new statement of policy in the House of Commons.

According to this, private enterprise would not henceforth be excluded but admitted into participation with the effort of the State. Mr. Bonar Law said :

"The policy to be adopted with regard to Imperial wireless communications has recently been under review by the Imperial Communications Committee under the Chairmanship of the First Lord of the Admiralty, and the recommendations of that Committee have now been approved by the government.

"In view of developments in the science of wireless telegraphy and other circumstances which have arisen since the late government decided upon the policy of a State-operated wireless chain, it is not considered necessary any longer to exclude private enterprise from participation in wireless telegraphy within the Empire.

"The government has therefore decided to issue licences for the erection of wireless stations in this country for communication with the Dominions, Colonies, and foreign countries, subject to the conditions necessary to secure British control and suitable arrangements for the working of the traffic.

"At the same time the government has decided that it is necessary in the interests of national security that there should be a wireless station in this country, capable of communicating with the Dominions and

owned and operated by the State. A station of this kind will therefore be erected as early as possible and it will be available for commercial traffic as well as for service messages."

Licences would therefore be issued for the erection of wireless stations in this country for communicating with the Dominions and Colonies and foreign lands. But there was still a question in the background which was to be the subject of prolonged negotiations between the government and the company. One thing was certain. The government would complete and operate its big station in course of erection at Rugby. The fear of a private monopoly in wireless was therefore laid to rest. Two other stations necessary for this country's wireless communications would be built, according to present anticipations, by the Marconi Company. What then was to be the control and the division of profits?

One principle was that the State and the private stations should work independently and in open competition with each other—an arrangement which would have entailed obvious inconveniences. Ultimately a pooling system was provisionally adopted. Government and company would control their own respective stations, and the Post Office would allocate the traffic with a Marconi Company's representative to watch the Post Office procedure, and with power of criticism and suggestion, but not of control. The receipts from the working

of the system would be pooled and distributed in strict proportion to the number of stations, *i.e.* two-thirds to the Marconi Company and one-third to the Post Office. The course of the negotiations and the difficulties encountered will best be gathered from the Postmaster-General's speech on Empire communications at the Imperial Economic Conference on Tuesday afternoon, October 16, 1923.

"I will now turn," he said, "to the question of wireless communication. I do not suppose there is any fundamental difference of opinion between us as to the importance of wireless services. A few enthusiasts anticipate that wireless will supplant communication by cable, but I think its proper function and probable development is rather to supplement than to supplant cable communications. In the present stage of wireless science it certainly does not provide either as accurate, or as reliable, or as swift communication as cables, and it is, moreover, open to interception, but all of us recognise its enormous potentialities, and improvements are developing every year, and the provision of up-to-date wireless service will increase the existing capacity of our means of Imperial communication and tend ultimately to the reduction of rates.

"The late government, acting on the advice of a Committee constituted in 1919, submitted to the Dominions a comprehensive

scheme for the provision of Imperial wireless stations, each of which would be owned and operated by the Dominion in which it was situated. This scheme, however, did not meet with the approval of the Dominions, and I can quite understand that, faced with the same financial difficulties that we are at home, they preferred to employ or license a private undertaking and so avoid the necessity of incurring the considerable capital expenditure entailed in the erection of State-owned stations. The Imperial Government accept the decisions they have come to.

"As regards Great Britain, the government have decided, in the first place, to provide themselves a station which will be owned and operated by the government ; and, secondly, to license private companies to conduct services subject to an agreement with the government as to the division of traffic between the companies and the government stations. We are pressing on with the government station as quickly as possible. A site near Rugby has been secured. The orders for a considerable portion of the plant have already been placed, and I anticipate that the station will be completed and ready for work before the end of next year, but we have not yet arrived at a satisfactory division of the services with the Marconi Company.

"The Marconi Company originally expressed a strong preference for a pooling

arrangement as between the government station and the company's station. There appeared to me to be disadvantages in a pool under which responsibility for the services would be, to some extent, divided, but as it was the basis which the company themselves desired, negotiations proceeded on that footing, and by the end of July last we had reached such a measure of agreement that only a few minor points were outstanding and I had hoped an agreement would have been completed within a few days.

"The company have, however, since then changed their minds and they have intimated that, for reasons which I am not altogether able to appreciate, this arrangement is not now acceptable to them. I regret that they did not arrive at this conclusion at an earlier date, for a good deal of delay would have been avoided, but I do not wish to press a scheme of joint working upon them if they are definitely opposed to it, and I have indicated that the government would be prepared to divide the services on what I may call a regional basis, which, at the outset, appeared to me to be the best arrangement, so that the services for Canada and South Africa, for example, should be conducted by the government station, whilst those for India and Australia should be conducted by the Marconi Company's station.

"The government station is to be erected partly for commercial and partly for strategic

reasons. It is essential that in parting with the monopoly which the Government possesses by statute we should secure that a sufficient amount of commercial traffic is reserved for the station to operate. Provided this is secured I shall be ready to meet, as far as I possibly can, any views which the Marconi Company may submit to me. The services to be given by the government station will not be less efficient than the Marconi Company's, and the government station is likely to be open for traffic before the company's, and I hope that the Canadian and South African Governments will see their way to concur in the proposal I am making."

During the discussion, the representatives of the Dominions expressed the view that the arrangements to be made for wireless in Great Britain was a matter entirely for the home Government.

The " regional " basis, that is, the restriction of a station to a certain part of the Empire was criticised as impracticable. There are periods of the day when communication, say with India, is impossible, owing to atmospheric conditions. The station restricted rigidly to India would have to remain idle during those hours, instead of being turned on to some other region. Such waste and delay would scarcely conduce to the financial prosperity of a wireless station. Moreover, it was said, the regional system

would sacrifice the great advantage of universality and elasticity of wireless and reduce it in some degree to the disability of the cable which has only two ends, and can communicate between only two points.[1]

The system of control in this arrangement seemed in the end unpleasing to the Marconi Company, which is no doubt moved by a strong desire to compete *à outrance* with the cable companies. It aspired to be more in touch with the message-sending public and to have a far more independent control of the operation of its own stations, always with a view to the eventual knocking-out of the cables. The government, on the other hand, had a more single eye for the public interest, which might not best be served by the elimination of the oceanic cables.

There was good reason to hope that the controversy would end in a working compromise, under which the wireless stations would be worked (*i.e.* messages sent to the stations) not exclusively from the General Post Office, but by the company and the Post Office at their own respective centres in London. The traffic would be pooled, but this arrangement would apply only to South Africa, Australia and India. As regards Canada the company and the Post Office would work competitively. There was good reason to hope that the unconscionable delay that has already so greatly

1 There seems to be no reason why the regional principle should have been so rigidly interpreted and applied.

prejudiced our interests would now be brought to an end.

It may be useful here to quote from an article by Mr. Robert Donald on the objects and requirements of an adequate wireless system for the Empire. He wrote :[1]

> "To come to the ideal Empire chain it should cover the whole British Empire with a network of wireless communications. These communications should be capable of spanning continents and bridging oceans. One grand trunk line, for instance, should link up England and Australia, capable of communication for a certain number of hours every day without interruption eastward, and by relaying through Canada, westward. Having established successfully this longest trunk route, there would then be other main lines in association with it, serving India, New Zealand, the Far East, Africa, Canada and the Pacific, and the West Indies with off-shoots, bringing within the radius of wireless the most distant outposts of Empire. All these stations would be feeders as required of the main trunk lines. All the Dominions and Colonies of the Empire should possess transmitting stations capable of sending messages to the stations with which they are in communication. The services should be reciprocal and universal.
>
> "Each division of the Empire would

[1] *Year Book of Wireless Telegraphy and Telephony* (1924).

supplement the Imperial system by national networks, so that the empty spaces in Australia, so vast that England could be dumped into them and lost, would be bridged by wireless ; the sparsely populated prairie provinces of Canada would also be wirelessed so that there would be no more isolated homesteads. The settled communities on the coasts of Africa, separated by tropical jungles, deserts and uncivilised regions from other white settlements, would be on speaking terms. The pioneers who ventured farthest north or farthest south into the Polar seas, cut off by thousands of miles from mankind, would be kept in touch with civilisation. There would be no more isolation in the world.

" The universal service of news and communication would make the whole world of Empire kin. Under such a scheme there would be no confusion or overlapping, as with coming developments wireless science would enable each region to have its own wavelength, and be kept as distinct as if it were a telegraph line. Secrecy will also be secured so that news messages could not be appropriated, and with automatic transmission and reception speed would reach a rate of over 100 words per minute. We shall then be coming closest to the ideal ; communications adequate, efficient, cheap, speedy, secret and universal.

" How best can this ideal plan be put in operation ?

"In the first place it should not and could not conveniently be separated from the rest of the world. An efficient Empire chain can cover not only that part of the British Empire which occupies one-fifth of the habitable globe, but also every other country. An Empire system of long-distance stations would be in the best position to carry on business with other nations, after the needs of the Empire have been first safeguarded. London has been the chief centre of world communication by cable, and it is in a still more favourable position to be the chief centre of communication by wireless. The Empire chain should be designed to meet all the strategic needs of the Empire in regard to defence, supplementary to the naval, military and air service wireless systems. The States of the Empire should also lay down the conditions under which wireless should be operated, and make provision for taking possession of it in times of national emergency.

"When we come to discuss who should own and operate this ideal Empire chain, we are approaching the region of controversy. There can, in my opinion, be no question that as regards operation, the most efficient results will be secured under private enterprise. All governments of foreign countries, except for official purposes, have given up wireless beyond their own borders. At this stage of wireless communication there are risks ahead, inventions to be developed, research

to be carried on, experimental work to be undertaken, all of which can generally be better carried out by individual enterprise than by government departments. The ideal Empire chain cannot be fashioned upon things as they exist to-day, but on inventions now only in course of development. The future belongs to wireless telegraphy and its twin wireless telephony, and what has been accomplished up to now is only an index of the far more marvellous achievements which await mankind."

The advent of a Labour Government introduced a new phase into the long-debated wireless question. On the very day that the Unionist Government was defeated in the House, the Post Office addressed a letter to the Marconi Company which produced a reply resulting in what Mr. Ramsay Macdonald described as " an absolute and complete deadlock." Mr. Godfrey Isaacs, writing to the new Postmaster-General on January 26, 1924, challenged the right of the Post Office to refuse licences to the Marconi Company, or to attach certain conditions to those licences. The new Government had therefore to consider this question *de novo*, and a small committee was appointed with remarkable promptitude to consider the situation. It was constituted as follows :

Mr. Robert Donald, LL.D. (Chairman).
Mr. F. J. Brown, C.B., C.B.E., Post Office.

Professor W. H. Eccles, D.Sc., F.R.S.
Sir Drummond D. Fraser, K.B.E.
Sir Henry H. Slesser, K.C., Solicitor-General, with
Mr. W. E. Weston, Post Office, Secretary to the Committee.

The Committee was asked " to consider and advise on the policy to be adopted as regards the Imperial wireless services, so as to protect and facilitate public interests," and it was requested to report with the least possible delay. Working under forced draught, the Report was actually presented on February 22, 1924. Its chief and most striking recommendation was that the State should construct and control the receiving and transmitting stations in this country, instead of the work being accomplished by private enterprise.

The main justification for this proposal, apart from the delay which had resulted from negotiations in the Bonar Law policy, is that the undertakng is on an Imperial plane of purpose and interest. A private company must consider, first and foremost, profit, and could scarcely be expected to complete the wireless chain by developing the less promising and profitable links with such colonies as East and West Africa, the Sudan and the Gold Coast. Yet these parts of the Empire cannot be left out of a system whose great political object is to promote Imperial unity.

Another most important consideration is that the Empire wireless services will be

largely used by the State for official despatches to the Dominions and Colonies, for naval and military messages, and for the distribution of Empire news. Under a privately-owned and controlled scheme, the Government would have to pay for these facilities, and the charge would be an offset against the cost of operating the wireless services by the State.

It will be noticed that the Report recommends, as a condition of public ownership and control, that an improved business organisation should be set up by the Post Office. Public business management during recent years has fallen into considerable disrepute, and it may be hoped that this condition will be only fulfilled.

The summary of the Recommendations, as given by the Committee itself, is as follows :[1]

EMPIRE SERVICES

(1) That the State, through the Post Office, should own all wireless stations in Great Britain for communication with the overseas Dominions, Colonies, Protectorates, and territories.

(2) That the Post Office should operate directly, under an improved business organisation, all the Empire stations in Great Britain.

(3) That as an alternative an exception be made to the foregoing recommendations in

[1] The Report is given in Appendix V.

the case of Canada, and that competition between the Post Office and private enterprise in the Anglo-Canadian wireless service, which exists at present, be continued, provided that, in any licence granted for the Anglo-Canadian service, public interests are safeguarded as regards conditions of working and terms of expropriation by the State.

(4) That in any licence granted to a private company, the State must reserve to itself the right to take possession or exercise control over the working of the licensed stations whenever in the opinion of the Government an emergency requires it.

(5) That the Leafield station should be enlarged as recommended by the Post Office wireless experts and engineers; that the new high-power station now building at Rugby should be extended to a sixteen-mast station, that a second new station of similar capacity be erected; and that these works should be put in hand without delay.

(6) That each of the high-power stations should be of world range, and equipped with the latest apparatus, so that the highest degree of efficiency can be attained.

(7) That, if necessity arises, full advantage be taken of the Patents and Designs Act, 1919 (Section 8), under which the Crown can acquire the use of all patented inventions which may be useful for public utility services such as wireless.

(8) That in order that State management and operation of Empire wireless may be carried out in a way to ensure the greatest efficiency, an improved business organisation should be set up by the Post Office, and that the Post Office Advisory Council of business men be consulted on this question.

(9) That the present terminal wireless station near Cairo be removed from the Empire system as soon as the requirements of the Admiralty are met by other stations, and the proposed new high-power stations in India, South Africa, and Australia are in operation.

(10) That the expert Wireless Telegraphy Commission be requested to report on the extent and cost of a wireless system for the Colonies necessary to complete the Empire network of wireless communications.

FOREIGN SERVICES

(11) That private enterprise be given facilities to develop wireless communcation with Continental Europe, as with the rest of the world outside the British Empire, subject, in the case of Anglo-Continental services, to suitable terms being arranged for the payment of royalties or otherwise in view of the competition which must exist between wireless and State-owned cables.

(12) That there should be free competition in foreign wireless, subject to the State

reserving the right of expropriation and the right to take possession and assume control in case of national emergency.

(13) For the present, the existing provisional licences for Continental services should be renewed, and the Post Office should concentrate its Continental traffic as far as possible at Northolt; the station at Stonehaven should be discontinued without avoidable delay; and arrangements should also be made to discontinue the station at Caister as soon as other provision is made for the traffic.

(14) That telegraphic and telephonic broadcasting to the Continent be carried on by the Northolt station.

Such are the proposals which it may be hoped, will at least form the basis for an efficient and sufficient system of Empire-linking wireless telegraphy.

Arms of

British Columbia. Alberta. Prince Edward Island.

CHAPTER X

WIRELESS TELEPHONY

Wireless telephony, though a natural corollary of wireless telegraphy, opens up of itself quite a new set of revolutionary possibilities. No one can imagine what the next twenty years may bring. The most desolate and inaccessible region of our terraqueous globe may be brought into immediate touch with all the happenings of the most populous and civilised centres. With the aid of a simple apparatus a man may bask in the warmth of a South Pacific coral island and listen to an opera being performed amid London's fog and frost, or attend a debate in the British House of Commons.[1] An Imperial Conference may be held without any one of its members in either hemisphere having to move beyond his own study. What changes in human life, in social and political conditions, may not result from these marvellous applications of new scientific knowledge! It may be useful here also to place on record the successive stages in development.

Wireless broadcasting in England was preceded by a number of demonstrations of long-distance wireless telephony. One of the

[1] A speech delivered by President Coolidge at 8.30 p.m., on December 10, 1923, at Philadelphia, U.S.A., was heard by wireless amateurs in England. The wave-length was 200 metres.

earliest of these was on March 19th, 1919, when Marconi's Wireless Telegraph Company established wireless telephone communication between Ballybunion in Ireland and Canada. This was followed in April, 1920, by oral messages of greeting transmitted from England, by several Italian journalists to their newspapers in Italy, by means of wireless telephony. The Marconi Company's long-distance apparatus at Chelmsford was employed for this purpose, and the messages were received at Centocelle, about four miles from Rome, by the editorial representatives of the interested papers. Later in the same month the President of the Spanish Chamber of Commerce in London sent a wireless telephone message from Chelmsford to the King of Spain on board Senatore Marconi's yacht *Electra* at Seville.

The first actual broadcasting of musical items took place between February 23rd and March 6th, 1920, when a number of concerts were transmitted by the Marconi Company from Chelmsford. The farthest distance away at which reception of these concerts was reported, was 1506 miles, on a Marconi Crystal Receiver, Type 31.

On Tuesday evening, June 15th, Madame Melba gave a wireless recital from Chelmsford, and her voice was clearly heard as far distant as Sultanabad in Northern Persia, as well as in Madrid and Berlin. In Norway the operator of the Tryvandshojen station, near Christiania, coupled the wireless receiver to the land

telephone circuit, and by this means the music was transmitted into the editorial offices of the Christiania *Morgenblaget*. In July of the same year a demonstration of the broadcasting of wireless music was given to the King of Spain at Marconi House. Songs and instrumental music were transmitted from Chelmsford, and were received at Marconi House on a frame aerial connected to a loud speaker.

The next development of note was the transmission of music from Chelmsford for the benefit of the Delegates of the Empire Press Union on their journey to Canada in July, 1920. This was received clearly on board the C.P.O.S *Victorian*, throughout her journey across the Atlantic to Sydney, Nova Scotia. Telephonic communication between Newfoundland and the *Victorian* was also established over a distance of approximately 650 miles on this occasion.

In the same month wireless telephone messages were sent to a number of Scandinavian newspapers by their London correspondents through the Chelmsford Station, and Mr. Lauritz Melchior, the celebrated Danish Royal Opera Tenor, sang a number of songs, which were clearly received in the Scandinavian capital. By arrangement with the various telephone departments, the telephone exchanges of the big Scandinavian towns were connected up with the wireless stations, thereby enabling subscribers to hear Mr. Melchior's concert.

On December 12th, 1920, Dr. A. Graham Bell, the distinguished inventor, and Lord Burnham spoke from Marconi House, London, to journalists assembled at Geneva to record the proceedings of the First Assembly of the League of Nations. In February, 1921, a temporary Marconi station at Surbiton transmitted a musical programme for the benefit of amateur wireless enthusiasts. In May, 1921, the result of the Derby was broadcast by wireless from a Marconi portable station on the race course. In June, 1921, American delegates to the International Rotary Convention in London, listened to a special broadcast wireless programme at Marconi House, the concert being transmitted from Chelmsford.

On February 10th, 1922, the Writtle Wireless Station, belonging to the Marconi Wireless Company, began a series of weekly broadcast concerts, for the benefit of amateurs. These continued until 9th January, 1923, when they ceased owing to the advent of general broadcasting. On February 25th, 1922, the music played at Princess Mary's wedding was radiated by wireless telephone from the Writtle station by means of gramophone records. Broadcasting from the London station at 2 LO began in May, 1922, the first transmission being a description of the Carpentier-Lewis fight at Olympia, round by round. In June, 1922, the Last Post and Réveillé, together with an address by Mr. Godfrey C. Isaacs, was broadcast from Marconi House in connection with

the unveiling of a memorial to Marconi operators who fell in the war. Wireless operators on the steamships round the coast of the United Kingdom stood-by in order to take part in the memorial service to their late comrades.

In the same month a demonstration of the value of wireless in attacking criminals was given in connection with the annual meeting of the Chief Constables' Association, Spring Gardens, London, messages being despatched from the London Broadcasting Station to a police patrol near Chelmsford. On June 20th, M. Carpentier broadcast a speech from Marconi House on behalf of the British Legion. On July 7th, 1922, an interesting record was placed to the credit of wireless by the broadcasting from Marconi House of the Overture and principal items in a new musical play, *Lumber Love ;* Miss Florence Smithson and Mr. Emmett Adams, the composer, taking part. On September 7th and 8th, reports on the progress of the King's Air Cup Race round Great Britain was broadcast at short intervals from Marconi House.

On October 7th, 1922, the Prince of Wales broadcast a message by wireless telephony from York House, through the 2 LO Station, to the Boy Scouts of Great Britain. On November 3rd, a demonstration of broadcasting in connection with transmission by wired wireless from Bristol to London was given. Reception took place at the London Polytechnic in

connection with a lecture by Mr. Shaughnessy, Engineer in charge of Wireless to the Post Office. On November 15th, election results were broadcast. In addition to these items some fifty other transmissions took place between May and November 1922, largely in the cause of charity.

We need not carry the chronicle further. The chief interest for the purposes of this book is the effect which these latter-day marvels and the further developments that are surely coming may have upon the destinies of the British Commonwealth. I mentioned at the outset Burke's argument, unchallengeable in those days, against any political union between England and her daughter states. "A great flood stopped him." "*Opposuit Natura.*" This plea was greatly impaired fifty years ago. To-day it has lost all its remaining force. It is for statesmen so to apply these triumphs of science over space and time, so that a United Empire may be at last not simply an aspiration, but an achieved and abiding reality.

APPENDIX I

List of the Principal Overseas Newspapers Filed at the Royal Colonial Institute (Exclusive of Government Gazettes).

Note.—In addition to the following papers, over 670 other newspapers, magazines, and periodical publications are received, making a total of more than 950 periodical publications.

DOMINION OF CANADA

Acadian Recorder (Halifax, N.S.)	D.
Alberta Farmer and Calgary Weekly Herald (Calgary)	W.
Brandon Daily Sun	D.
British Columbian (New Westminster)	W.
Calgary Daily Herald	D.
Canada (London, England)	W.
Canadian Countryman (Toronto)	W.
Canadian Forum (Toronto)	W.
Canadian Gazette (London, England)	W.
Cowichan Leader (Duncan, B.C.)	W.
Daily British Whig (Kingston, Ontario)	D.
Daily Colonist (Victoria, B.C.)	D.
Daily Gleaner (Fredericton)	D.
Daily Mail and Empire (Toronto)	D.
Daily News (Nelson, B.C.)	D.
Daily News (Prince Rupert, B.C.)	D.
Daily Times Journal (Fort William)	D.

Devoir (Montreal)	D.
Edmonton Journal	D.
Evening Telegram (Toronto)	D.
Gazette (Montreal)	D.
Globe (Toronto)	D.
Goderich Star	W.
Halifax Herald	D.
Hamilton Herald	D.
Hamilton Spectator	D.
Manitoba Free Press (Winnipeg)	D.
Montreal Daily Star	D.
Montreal Herald	D.
Moose Jaw Evening Times	D.
Morning Albertan (Calgary)	D.
Morning Bulletin (Edmonton)	D.
Morning Chronicle (Halifax, N.S.)	D.
North Shore Press (North Vancouver)	W.
Nova Scotian (Halifax, N.S.)	W.
Ottawa Evening Citizen	D.
Porcupine Advance (Timmins, Ontario)	W.
Portland Canal News (Stewart, B.C.)	W.
Presse (Montreal)	D.
Quebec Daily Telegraph	D.
Saskatoon Phœnix	D.
Sidney and Islands Review (Sidney. B.C.)	W.
Standard (Montreal)	D.
Vancouver Daily Province	D.
Vancouver Daily World	D.
Vancouver Sun	D.
Weekly Ontario and Bay of Quinte Chronicle (Belleville)	W.
Winnipeg Evening Tribune	D.

Appendix I

NEWFOUNDLAND

Daily News (St. John's)	D.
Evening Telegram (St. John's)	D.
Free Press (St. John's)	W.
Royal Gazette (St. John's)	W.
Western Star (Curling, Bay of Islands)	W.

WEST INDIES

Barbados Globe	Tri-weekly.
Barbados Standard	W.
Chronicle and Dependency News (Turks and Caicos Islands)	W.
Clarion (Belize, British Honduras)	W.
Daily Argosy (Georgetown, British Guiana)	D.
Daily Chronicle (Georgetown, British Guiana)	D.
Daily Gleaner (Kingston, Jamaica)	D.
Dominica Chronicle	Bi-weekly.
Dominica Guardian	W.
Federalist and Grenada People	W.
Herald (Kingston, Jamaica)	W.
Jamaica Times (Kingston, Jamaica)	W.
Nassau Guardian (Bahamas)	D.
Port-of-Spain Gazette (Trinidad)	D.
Tribune (Nassau, Bahamas)	Tri-weekly.
Voice of St. Lucia	W.
Weekly Illustrated Paper (Bridgetown, Barbados)	W.
West India Committee Circular (London, England)	Fortnightly.
West Indian (Grenada)	Fortnightly.

INDIA AND THE EAST

Advocate of India (Bombay)	D.
Baghdad Times	D.
British North Borneo Herald (Sandakan)	M.
Ceylon Daily News (Colombo)	D.
Ceylon Independent (Colombo)	D.
Ceylon Morning Leader (Colombo)	D.
Ceylon Observer (Colombo)	D. and W.
China Express and Telegraph (London, England)	W.
Civil and Military Gazette (Lahore)	D.
Englishman (Calcutta)	D. and W.
Hong-Kong Daily Press	D.
Hong-Kong Telegraph	D.
Madras Weekly Mail	W.
Malay Mail (Kuala Lumpur)	D.
Manchuria Daily News (Dairen)	D.
New Empire (Calcutta)	D.
North China Herald (Shanghai)	W.
Overland China Mail (Hong-Kong)	W.
Palestine Weekly (Jerusalem)	W.
Palestine (Jerusalem)	W.
Pinang Gazette and Straits Chronicle (Penang)	D.
Pioneer Mail (Allahabad)	W.
Rangoon Gazette	W.
Sarawak Gazette (Kuching)	Fortnightly.
Shanghai Times	D.
Singapore Free Press	W.
Straits Budget (Singapore)	W.
Straits Echo (Penang)	W.

Straits Times (Singapore)	D.
Times of Ceylon (Colombo)	D.
Times of India (Bombay)	D. and W.
Times of Malaya (Ipoh, Perak)	D.
Times of Mesopotamia (Basrah)	D.
Weekly Rangoon Times	W.

AFRICA

African World (London, England)	W.
Aurora (Freetown, Sierra Leone)	W.
Bedford Enterprise (Cape Province)	Bi-weekly.
Beira News	D.
Bulawayo Chronicle	W.
Cape Argus (Cape Town)	D.
Cape Mercury (Cape Town)	D.
Cape Times (Cape Town)	D.
Courier (*Beaufort West*)	W.
Daily Representative and Free Press (Queenstown)	D.
Dar-es-Salaam Times	W.
Diamond Fields Advertiser (Kimberley)	D.
East African Standard (Nairobi)	W.
Eastern Province Herald (Port Elizabeth)	D.
East London Daily Despatch	D.
East Rand Express (Boksburg)	D.
Egyptian Gazette (Alexandria)	D.
Friend (Bloemfontein)	D.
Gatooma Mail	W.
Goede Hoop (Cape Town)	M.
Gold Coast Independent (Accra)	W.

Gold Coast Leader (Cape Coast)	W.
Gold Coast Times (Cape Coast)	W.
Grocott's Penny Mail (Grahamstown)	Tri-weekly.
Gwelo Times	W.
Heidelberg News	W.
Kenya Observer (Nairobi)	W.
Lagos Weekly Record	W.
Livingstone Mail (Livingstone, Rhodesia)	W.
Lourenço Marques Guardian	Tri-weekly.
Lydenburg News	W.
Mafeking Mail	D.
Natal Mercury (Durban)	D. and W.
Natal Witness (Pietermaritzburg)	D.
Nigerian Pioneer (Lagos)	W.
North Western Press (Preiska)	W.
Nyasaland Times (Blantyre)	W.
Planters' and Commercial Gazette (Mauritius)	D.
Pretoria News	D.
Rand Daily Mail (Johannesburg)	D.
Record (*Klerksdorp*)	W.
Rhodesia Advertiser (Umtali)	W.
Rhodesia Herald (Salisbury)	W.
St. Helena Guardian	W.
Sierra Leone Weekly News (Freetown)	W.
Somerset Budget (Somerset East)	W.
South Africa (London, England)	W.
South African Lady's Pictorial (Cape Town)	M.
South African Pictorial (Johannesburg)	W.
South African Review (Cape Town)	W.
Standard (Krugersdorp)	W.
Star (Johannesburg)	D.

Sudan Herald (Khartoum)	W.
Sudan Times (Khartoum)	W.
Sunday Times (Johannesburg)	W.
Times of Natal (Pietermaritzburg)	D.
Times of Nigeria (Lagos)	W.
Uasin Gishu Weekly Advertiser (Eldoret, Kenya)	W.
Uganda Herald (Kampala)	W.
Uitenhage Times	Bi-weekly.
Victoria West Messenger	W.
West Africa (London, England)	W.
Windhoek Advertiser	W.
Zoutpansberg Review (Pietersburg, Transvaal)	Bi-weekly.
Zuid-Afrikaan (Cape Town)	Bi-weekly.
Zululand Times (Eshowe)	W.

AUSTRALIA

Advertiser (Adelaide)	D
Age (Melbourne)	D.
Argus (Melbourne)	D.
Armidale Express	Bi-weekly.
Australasian (Melbourne)	W.
Ballarat Courier	D.
Ballarat Star	D.
Bendigo Advertiser	D.
Brisbane Courier	D.
British Australasian (London, England)	W.
Bulletin (Sydney)	W.
Capricornian (Rockhampton)	W.
Chronicle (Adelaide)	W.

Colonist (Maryborough)	W.
Daily Mail (Brisbane)	D.
Daily Telegraph (Launceston)	D.
Evening News (Rockhampton)	D.
Examiner (Launceston)	D.
Forum (Sydney)	Fortnightly.
Geelong Advertiser	D.
Goulburn Evening Penny Post	D.
Herald (Melbourne)	D.
Illustrated Tasmanian Mail (Hobart)	W.
Kalgoorlie Miner	D.
Leader (Melbourne)	D.
Maitland Daily Mercury (West Maitland)	D.
Mercury (Hobart)	D.
Newcastle Morning Herald	D.
News of the Week (Geelong)	W.
North Queensland Register (Charters Towers)	W.
Observer (Adelaide)	W.
Pastoral Times (Denilquin)	W.
Queenslander (Brisbane)	W.
Referee (Sydney)	W.
Register (Adelaide)	D.
Sun (Sydney)	D.
Sunday News (Sydney)	W.
Sunday Times (Perth)	W.
Sunday Times (Sydney)	W.
Sun News-Pictorial (Melbourne)	W.
Sydney Mail	W.
Sydney Morning Herald	D.
Table Talk (Melbourne)	W.
Telegraph (Brisbane)	D.
Weekly Courier (Launceston)	W.

West Australian (Perth)	D.
Western Argus (Kalgoorlie)	W.
Western Mail (Perth)	W.

NEW ZEALAND

Auckland Weekly News	W.
Bay of Plenty Times (Tauranga)	D.
Budget (New Plymouth)	W.
Dominion (Wellington)	D.
Evening Post (Wellington)	D.
Examiner (Woodville)	Tri-weekly.
Hawkes Bay Herald (Napier)	D.
Levin Daily Chronicle	D.
Lyttelton Times (Christchurch)	D.
Manawatu Evening Standard (Palmerston North)	D.
New Zealand Farmers' Advocate (Wellington)	W.
New Zealand Free Lance (Wellington)	W.
Otago Daily Times (Dunedin)	D.
Otago Witness (Dunedin)	W.
Poverty Bay Herald (Gisborne)	D.
Rangitikei Advocate (Marton)	D.
Southland Times (Invercargill)	D.
Star (Christchurch)	D.
Timaru Herald	D.
Wanganui Herald	D.
Weekly Press (Christchurch)	W.

PACIFIC

Fiji Times and Herald (Suva)	D.
Papuan Courier (Port Moresby)	W.
Planters' Gazette (Gizo, Solomon Islands)	Q.
Samoa Times (Apia)	W.

MALTA

Malta Daily Chronicle	D.

D.—Daily. W.—Weekly. M.—Monthly.

APPENDIX II

Other resolutions passed by the 1920 Conference were :

News Carriers.—This Conference affirms the principle that no news carrier, whether by cable or wireless, should be concerned, directly or indirectly, with the collection and distribution of news.

Paper Supply.—That the question of paper supplies being of vital importance to members of the Empire Press Union, steps should be taken to ensure adequate supplies throughout the Empire, and that a standing Committee be appointed to consist of two representatives of the British Isles, one representative appointed by each Overseas delegation, and the President, who is to be Chairman.

Interchange of Staffs.—This Conference is of opinion that much benefit would result from the provision of opportunities for the interchange of members of staffs of British and Dominion newspapers, with the object of increasing the efficiency with which information from different parts of the Empire is handled, and as a means of exchanging ideas regarding newspaper organisation ; and that due regard be had to the interests of women journalists in this connection.

Travel Scholarships.—That a Committee of

the Empire Press Union be appointed to confer with its Overseas sections and with all Universities within the British Empire which provide courses of journalism, in order to frame a scheme of travel scholarships for young journalists of proved capacity, and to take such other steps as may be necessary to encourage this movement; and that in this connection due regard be had to the interests of women journalists.

Commercial Laws: University Curricula.—That, with a view to strengthening further the bonds of Empire, this Conference affirms:

(*a*) The advisability of bringing the Commercial Laws of the various Dominions as much as possible into line and possibly evolving a code of commercial laws for the whole Empire.

(*b*) The advisability of harmonising the curricula of the Universities of the Empire, as far as possible, and consistently with the exigencies and requirements of each, in order to render possible or facilitate the interchange of lecturers and students.

Enlargement of the Empire Press Union: Quadrennial Conferences.—This Conference is of opinion that the time has arrived when the scope and activities of the Empire Press Union can usefully be extended to provide for admission to membership of the weekly Press, and of magazines, and of technical and trade journals, both individually and through their respective federations or societies; also news-agencies, and other organisations directly

concerned with the collection for publication in newspaper form of information of a literary, technical, or trade character of inter-Imperial concern.

This Conference therefore requests the Council of the Empire Press Union to take in hand the revision of the Constitution, with the appropriate alteration of the Articles of Association and of the By-laws, including the fixing of a lower annual subscription than that in force for daily newspapers, except in the case of federations or societies; and to provide for representation on the Council of these additional interests to the limit of one-third of the total membership of the Council.

This Conference recommends other alterations in the By-laws, namely:

(*a*) That more than one section may be formed in any principal country provided there is clear divergency of interests between the daily Press and other responsible publications, but without providing for separation into different sections of publications belonging to the same category.

(*b*) Each branch to be entitled to elect its own members and associates.

It is further requested that the Council of the Union shall circulate the amended Constitution when drafted to the various existing sections for consideration and comment, it being understood that each section shall have the right to determine whether it shall accept

the larger Constitution, or leave the new interests to form their own section.

It is the hope of this Conference that the Press of every country in the Empire will seek to promote the cardinal objects of the enlarged Union, and that the new Constitution may be brought into active operation by June 1, 1921, or as soon after as may be possible.

This Conference pronounces in favour of holding Conferences at fixed intervals of four years, and only by general agreement in consultation with all sections should any Conference be advanced or postponed.

Empire Mails: Statement by Postmaster-General.—At the afternoon session of the Economic Conference on October 16, 1923, Sir Laming Worthington-Evans, Postmaster-General, spoke as follows on the mail services of the Empire:

> "I propose, if the Conference desires it, to give a brief *résumé* of the position of the mail services, the telegraphic services, and wireless. I suppose all the Dominion Governments are pressed, just as we are at home, from many quarters to provide quicker and more frequent services to the oversea parts of the Empire, without much regard to the cost which would be entailed by doing so. It may be useful, therefore, to emphasise, at the outset, the elementary and obvious fact that ultimately the frequency and, to some

extent, the speed of the mail services must depend upon the cargo and passenger traffic upon each route. The payments under a mail contract can, at most, represent a very small proportion of the cost of running a service, and it is therefore impossible, within reasonable limits of expense, to provide services in excess of what the passenger and cargo traffic demand.

"The development and improvement of the mail services, therefore, proceed *pari passu* with the improvements in the commercial services which increased commercial intercourse between the different parts of the Empire brings in its train, and it has been the policy of successive British Governments for very many years to confine the mail subsidies to the payments for services rendered, by which I mean not only the actual conveyance of the mails, but the acceptance by the shipping companies of a definite standard of regularity and speed on the route to which the contract relates. In our view, the justification for a contract lies in the fact that without it the sailings on a particular Imperial route would be irregular and slow. On certain routes, served by several different lines, we find that the best service is obtained not by a contract with a particular company but by utilising the ships on each and every line as may prove most convenient. For example, the West Indies, which before the war were served by contract ships giving as

a rule a fortnightly despatch of mails, are now served by four or five different lines, giving a despatch to most of the islands at least once a week and, in some cases, oftener.

"As regards the main services which are still performed under contract, either with the Home Government or with one of the Dominion Governments, considerable improvements has been effected in the last two years. We have now on some of the important routes regained the pre-war standard. For example, the South African mail carried by the Union-Castle Company under contract with the Union Government is now as it was before the war—a weekly service, occupying seventeen days in transit. To Canada the fastest service is performed by the Atlantic lines via New York, and it is also practically as good as pre-war, except that in the winter months some of the largest and fastest ships of the Cunard and White Star line are laid up and slower boats have to be substituted. The Indian mail is a weekly service, as it was before the war, but the transit time is twenty-four hours longer.

"The Australian service is not so satisfactory. Before the war a weekly service was provided by the P. and O. Company in contract with the British Government and by the Orient Line in contract with the Commonwealth Government in alternate weeks. These companies are now only able to provide a fortnightly service between them, but by using

the ships of the Commonwealth Line it is usually possible to secure a despatch of mails three weeks in each month. Both the P. and O. and the Orient companies have just arranged for an acceleration of their services, which will shorten the voyage to Australia by two days and practically restore the pre-war time of transit."

APPENDIX III

Airships for the Empire.—The following is taken from a lecture delivered on January 22, 1924, before the Royal Colonial Institute, by Commander F. L. M. Boothby, C.B.E., R.N.

When considering the possibilities of airships in the future we should think what the old sailing ships did. They depended entirely on the wind for getting anywhere; the airship is assisted by engines driving her at 80 miles per hour if required. When the sailing ship struggled against the wind, she had to struggle against the force of the sea which swept her decks, and the tides that affected her course and speed. The airship is free from this. The head resistance of a sailing ship lying at anchor head to wind is infinitely greater than that of an airship doing the same. When we consider what our forefathers did with sailing ships, all the disadvantages, difficulties, and discomforts that they suffered, and how they linked up the Empire, in spite of them all, it makes us feel, I think, a little ashamed that we have done so little with that great gift of the airship with which our generation has been blessed. But we are making a start, and if our descendants are as good as our forefathers of the sailing

ship era, great things will be accomplished by the end of the century.

It looks as though a beginning would be made shortly with the Australian route. This has the advantage over a trans-Atlantic route, that it can be developed in stages, and that on the first stage, that from England to Egypt, the weather conditions are known, and there are stations in the neighbourhood of the track, where assistance could be given if required when new types of airships are being experimented with, and crews trained.

Several proposals for this Australian service have been forwarded in response to Air Ministry requests, the Chairman, I know, was responsible for the original one, and there were at least four others. The one I am outlining here is merely typical, and is given because it is the one with which I am best acquainted. The main points of difference between schemes put forward lie in the length of the stages to be run non-stop. It is perfectly feasible to run straight through to Egypt, from there to Delhi, from Delhi to Singapore, and Singapore to Port Darwin. You will save time by doing so. You will also save expense in the erection of mooring masts, etc., compared to a system running shorter stages. Against that you must balance the fact that on the long stages you can carry much less load. For instance, assuming that you are running at 2000 h.p., and do your journey to Egypt in 48 hours, you will consume about 20 tons of fuel and oil. Allowing for a

margin of 50 per cent., which is rather low, she must carry 30 tons of fuel and oil. If, on the other hand, she runs out in 12-hour stages, she will require 5 tons of fuel, and with a 50 per cent. margin this amounts to $7\frac{1}{2}$ tons, allowing $22\frac{1}{2}$ tons more load to be carried.

With passengers at five to the ton, this makes a considerable difference to the revenue. Again, insurance charges should be lower on the short stage system, as there is always a base with eight hours, and a larger average load is likely to be obtained with more frequent stops. Also, nothing is more boring than a long airship flight if above the clouds or over the sea; normally there is little motion or noise and nothing much to see. The average passenger will be glad to spend a couple of hours breakfasting at Marseilles after a night trip from England, dining at Rome, with breakfast again at Athens, before reaching Egypt in the evening. It is for these reasons that the short stage system is adopted in these proposals. Stage one, then, would be as indicated above. The chief difficulties to be expected are from the weather conditions in England. Stage two, would be Egypt to Delhi, stopping at Basra, Jask, and Karachi. On this stage the chief difficulty is to be expected from the heat over the desert between Egypt and Basra. Heat greatly reduces the lifting power of airships, and consequently the paying load. If the trip is made by night it should be quite feasible; the latest reports from aeroplane officers who

have served there for two or three years is to the effect that about 3000 feet one gets out of the extreme heat into quite a reasonable temperature, and that night flying conditions are otherwise very good. With an enterprising Air Ministry we should have had a surveying airship out testing this portion of the route, but as it is we can only say that there is no apparent reason why it cannot be flown over regularly, and if we can do so, then nothing worse in the way of temperature conditions is to be expected on the rest of the route. Stage three would be Delhi, Calcutta, Rangoon, Bangkok. The chief feature in stage three is the height of the hills between Rangoon and Bangkok. It will probably pay to lengthen the journey to find a suitable pass to fly over, and I have allowed for this. It is a debatable point whether it would not be better to go to Penang instead of Bangkok. There is more trade at Penang, I believe, but Bangkok being a capital city may make it the more desirable place of the two at which to call. In stage four, we touch at Java, Batavia, with its large population and great trade interests, and Macassar, in the Celebes Islands. Little traffic need be expected to Macassar; it is merely a convenient point of call near the track to Port Darwin.

Arrived in Australia, the question we have to decide is whether it will pay to run the same airship right through to the big centres of population in the South, or distribute the passengers and mails by means of a local service.

When the trans-Continental railway is through to Port Darwin the traffic to Adelaide and Melbourne can best be carried by train—the airship cannot compete with the train for regular running and cheapness. There seems an opening for a local airship service to connect up heads of the four railways running in from the East Coast, and thence to Sydney and New Zealand, and possibly another service from Port Darwin down the west coast if traffic justifies it. These services can well be run by smaller and cheaper airships than those required for the main route, supplemented by aeroplane services as required. From the Imperial point of view it is most desirable that Australia or New Zealand should establish an airship-building industry, and maintain a fleet of their own airships available in war for work in the Pacific. It may well be that in the future the contribution of the Dominions and Colonies towards the defence of the Empire will largely consist of aircraft, as, owing to the large distances to be covered, and the undeveloped state of roads and railways, air transport is of more immediate benefit to them in time of peace than it is to the inhabitants of the British Isles.

It is estimated that a capital of about £6,000,000 will be required to establish a bi-weekly service to Australia. Twelve airships of 120 tons would be required, eight on service, and four undergoing overhaul and in reserve. They would cost £2,889,000. Large airship stations would be established in Egypt,

at Delhi, Singapore, and Port Darwin. They would cost £1,000,000 all told. Thirty mooring masts at these stations and at the intermediate points would be needed, costing £450,000. A constructional station with the necessary equipment would be necessary, costing £250,000, while the cost of bringing the existing airships into commission for survey and experimental work and running a small preliminary service while the bigger airships are building is put at £318,000, leaving £1,102,000 as working capital. If we take the fare to be £35 per stage, *i.e.* £70 to India, £105 to Singapore, and £140 to Australia, and that each ship carries 10 tons of mails at £224 per ton (3d. per oz.), a profit of 15 per cent. on capital should be earned, provided an average of 70 per cent. of the full load is carried. What percentage of the full load would be obtained in practice, and to what extent the fares and postal charges could be increased without affecting the volume of the traffic is a matter for individual opinion, till results are obtained in practice. If the service is provee to be safe, and we must lend every effort to make it so, I have little doubt that the 70 per cent. full load will be easily forthcoming. The figures are conservative. I have assumed that we only have a useful lift of 54 tons available ; in favourable conditions it will be 65. Insurance is a difficult point, but it is allowed at the rate of 10 per cent. The insurance companies say that for the first ships of their class,

before they are tested and proved to be satisfactory, the rates will be higher, but that after that there is no reason why they should not be lower. Much depends on the personnel. It is all team work. With a good team of skilled officers and men things run like clockwork. Above all the captains of airships and the meteorological officers must work in the closest co-operation. The gas officers must have supplies available to the moment, and the men who overhaul the engines should be men who have flown, or better still, who take their turn at flying. It took the whole war to train the airship personnel, and in 1919 it was fit for anything. It has all been destroyed, and it will take two years at least to build it up again. It is no use trying to extemporise personnel, as was shown when we used to train aeroplane pilots in a hurry, no less than 264 of the best boys the country produced being killed in the first quarter of 1918—not in action with the enemy, but in training accidents, due to their being rushed through the necessary courses. The government might well do something to assist with the insurance of airships till a competent personnel for them is again available, not only for actual flying but for the groundwork as well. Depreciation of airships is assumed to be at the rate of 20 per cent. per annum. It is reasonable to hope that it will be lower than this in practice. Outer covers and engines will have to be renewed frequently, and gas bags less frequently, but there is no apparent reason

why a good hull should not last for many years, with proper care and attention.

Just a word as to Canada. In that Dominion is located the only known helium gas supply in the Empire. There may be others, our authorities have never troubled to organise a search for this invaluable element. I am informed by Professor McLennan, of Toronto University, and there is no higher authority, that 10,000,000 cubic feet of helium are bubbling to waste annually, and that there may be other supplies in territory as yet unexplored. The helium-filled airship is the most formidable weapon in the world, the gas cannot be set on fire by any possible means known to science. If Canada was to erect a big airship base in Alberta she would be in a position to transfer her air power to the Pacific or Atlantic as required inside 48 hours. Normally, the airship fleet could be used to develop traffic in a north and south direction, transport facilities here being inferior, owing to most of her railways running east and west. At the moment we have nothing in the British Empire to compare with the American Navy's helium-filled airship *Shenandoah*. Seeing that a navy is a comparative luxury to a vast self-contained country like the United States compared to the stern necessity of one for Great Britain, if we are to insure our citizens against starvation, it does not seem right that we should be entirely lacking in this most important naval auxiliary, and we must look to Canada

to redress the balance in the immediate future. I would also appeal to the inhabitants of other parts of the British Empire to bear the importance of helium in mind, and wherever they may find a supply of natural gas, to take a sample and have it tested. If it contains anything in the nature of one per cent. or even a half per cent. of helium he will have a valuable property, and added materially to the defensive resources of the Empire.

We shall not get our Air Power, founded on sound commercial air services, in time to be of service if difficulties crop up in Europe or in the Pacific unless the rising generation can be educated in air matters and urged to make their careers in the flying services. No matter how good our material, unless the men are second to none, it is all wasted. We now have an Air League of the British Empire, founded for this very purpose, and I would like to urge all members of the Royal Colonial Institute to support it. Branches are required in every Dominion, State, and Colony, and members of this Institute might well lend a hand in the work, or failing that, subscribe funds to enable others to do so. Above all things let us try to examine everyday questions from the air point of view. The importance of Bermuda and Bathurst as air termini. Home Rule in Egypt and its effect on what must be the biggest air junction where the lines from Europe, Asia, Africa, and Australia will meet, the effect of the restoration of Wei-Hai-Wei to China, when

it should have been a base for the air traffic from Britain via Russia, and its distribution throughout the populous Chinese Empire. The real value of property in London compared with the value in other large cities less vulnerable from the Continent; mining development, seeing that we can now carry five-ton concentrated loads over country otherwise impassable, etc., etc.

Every problem takes on a somewhat different aspect when the approaching air developments are taken into account. These developments are coming, whether we lead, as we should, or not. At present, France, the United States, and Italy lead, and this country a bad fourth. Every height, speed, and duration record for every type of aircraft is held outside the British Empire. We are notoriously slack in research work, even Germany has kept ahead of us there.

Australia might well erect its own base at Port Darwin and run her own service to Singapore, where a base is necessary for aircraft working with the Fleet. The chain would soon be completed if work began at both ends. South Africa could also erect its own base and run a direct service to Australia, going south into the westerly winds of the "roaring forties," and returning via India and Egypt. The formation of an Imperial Air Board would appear to be the great need of the moment, to study the Empire's resources in air material, to standardise the fittings and appliances, to

study and survey the great air routes, and then, in the light of knowledge acquired, to make recommendations to the governments concerned. Even if our Air Ministry were not so placid, as it is, it could not do this work unaided. Members of the Air Boards of all the great Dominions, as well as representatives of the Air Ministry must serve together to further the cause that means so much for the future of the Empire.

APPENDIX IV

The Shipping Report.—The Report of the Imperial Shipping Committee on the economic size and speed of vessels trading between the United Kingdom and Australia (Cmd., 1917), contains much useful information. Having discussed the mechanical question of faster services, the Report continues :

The Question of Routes.—We have next to assess the relative merits of the route or routes upon which the contemplated faster service might operate. That route should be preferred which affords the maximum possibility of acceleration at the minimum net expenditure, regard being had to the cost of the vessel, the cost of running and the probable revenue to be earned. Judged by this test, the route via the Suez Canal displays an undeniable superiority over that via the Cape of Good Hope, via Panama, or via Vancouver, as the following considerations will indicate.

The mail services maintained to Australia at the present time by the Peninsular and Oriental Steam Navigation Company and the Orient Steam Navigation Company follow the Suez route. In both of these services, the mails are sent overland for embarkation at a Mediterranean port to save the time involved in the sea journey via Gibraltar. The Orient mails are

at present taken on board at Toulon and those of the P. & O. at Marseilles. Before the war these companies' ports of call for mails were Taranto and Brindisi respectively. In the discussion on the Suez route which follows, we have assumed Toulon and Taranto as the Mediterranean terminals, but what we have to say is, of course, equally true in respect of Marseilles and Brindisi.

London and Melbourne being taken as terminal points, the distances from Great Britain to Australia by the various routes are as follows:

Route.	Nautical Miles.[1]		
	Land Section.	Sea Section.	Total Distance.
Via Toulon, Suez Canal and Fremantle	2,636	8,148	10,784
Via Taranto, Suez Canal and Fremantle	3,125	7,550	10,675
Via Cape of Good Hope and Fremantle	1,884	10,825	12,709
Via Panama and Sydney and over-land to Melbourne	513	12,481	12,994
Via Canada and Sydney and over-land to Melbourne	3,860	9,322	13,182

The route via Canada may, we think, be eliminated by consideration of distance. Although the land transit is 735 miles longer

[1] Distances on land have deen reduced to nautical miles to render them comparable with the distances on the ocean.

than via Taranto and the Suez Canal, the sea transit also is 1772 miles longer. For this route to compete with the Suez route, a very costly superiority in speed would be required on the Pacific section of the journey.

Of the three remaining routes, that by Suez is the shortest as a whole, and it contains also the longest land transit. If Toulon be taken as the port of mail embarkation, the land sections of the journey are 752 miles more than in the case of the Cape route and 2123 more than in the case of the Panama route. If Taranto be taken as the mail port, the corresponding advantages in favour of Suez as compared with the other two routes are 1241 and 2612 miles respectively. We shall revert to the significance of this land factor later.

The sea distances from Toulon and Taranto to Fremantle via Suez are 8148 and 7550 miles respectively, and from London to Fremantle via the Cape is 10,825 miles. This shows a saving of 2677 miles on the sea voyage in the case of Toulon, and 3275 miles in the case of Taranto. As against these gains by the Suez route, the only set-off in favour of the Cape route is the time taken to convey the mails by land from London to Toulon or Taranto and embark them, namely, 1 day 10 hours in the case of the former and 2 days 5 hours in the case of the latter. Consequently, assuming an average sea speed of say 15 knots, the Cape route would entail a time of transit longer by 6 days 20 hours than that via

Taranto. The same considerations apply in the case of the Panama route, where the additional time involved is even greater.

From the point of view of speed, therefore, the Suez route offers particular advantages over other routes, not only because the aggregate transit is the shortest, but also because so large a proportion of the journey is on land.[1] A further feature of importance, so long as coal is the fuel, is that whereas the longest sea section between bunkering ports on the Suez Route is 3390 miles, the longest by the Cape is 6480 miles, by Panama, 7692 miles, and by Canada 4417 miles. This involves on the other three routes, as compared with Suez, an increase in bunkers with a corresponding decrease in cargo capacity. In the case of oil-burning ships, however, the importance of this factor is diminished.

We have examined the alternative of a fast service via the Cape of Good Hope to be subsidised in part by the Union Government. It seems to us, however, that this alternative involves grave difficulties. The Union Government, as providing a portion of the subsidy, would necessarily demand the allocation of a certain proportion both of passenger accommodation and cargo space. This would lead to the uneconomic result that ships would have to run partially empty both ways between the

[1] The case for the Suez Route, from the point of view of mails, is stated in a letter from the Postmaster General to the Colonial Office, dated 3rd April. 1914. It is printed in full among the Dominions Royal Commission Papers in Cd. 8460 of 1917.

two Dominions, failing some material development of their trade with one another in the future.

Another possible solution which we have taken into account is that of a fast service having a Mediterranean port and Fremantle as its terminal points. We find ourselves, however, obliged to reject it. At the Australian end, the use of Fremantle as a terminal port would mean that cargo and parcel mails to or from other parts of Australia would have to bear the heavy cost of railway haulage or be transhipped to coasting vessels ; and the transport of produce in refrigerated cars across the continent, even if possible, would, we imagine, be prohibitive in cost. At present a large proportion of passengers to and from the Eastern States of Australia make the whole journey by sea. To embark or disembark at Fremantle would involve a long railway journey which might prove inconvenient and expensive, especially to passengers with children. The business man or other traveller, to whom a saving of time is essential, already travels by the Trans-Continental Railway, and the use of Fremantle as a terminal would make no difference to him.

Further, there is at present no graving dock at Fremantle, nor adequate terminal facilities for overhaul. Vessels needing dry dock repairs would have to proceed to Sydney, with a consequent dislocation of the service. Even more formidable objections would apply to a Mediterranean terminal. Cargo to and from Great

Britain would become an impossibility, and the conveyance of emigrants across France would be a grave handicap to the service. Moreover, it seems to us contrary to Imperial interests either to base a fast Imperial service on a foreign port, or to have the overhaul and repairs effected in a foreign country.

Acceleration on the Ocean Portion of the Suez Route.—We have accordingly arrived at the conclusion that, for a fast service to Australia, the Suez route offers decisive advantages, and that such a service must have for its terminals a port in Great Britain and a port in the Eastern States of the Commonwealth. The existing mail services, which in point of fact already use this route, are the four-weekly service maintained under contract with the Imperial Government by the P. & O., and the similar service maintained under contract with the Commonwealth Government by the Orient Line. The former contract as we shall see later includes the Eastern mails as well as the Australian mails. By each of these services the mail time from London to Fremantle is 28 days. The Commonwealth Government Line also carries mails at poundage rates in a similar time, the mails being transhipped from the P. & O. Indian Mail at Port Said. The Government Line provides 15 sailings annually, and the three lines between them give 41 despatches annually in each direction.

The itineraries of the contract services vary and must be considered separately. The Orient

Company at present follows the more direct route. After leaving Toulon, their vessels proceed to Naples to embark freight and passengers and thence via Suez and Colombo to Fremantle. The contract in this case provides for a transit time of 632 hours outward and 642 homeward between Toulon and Fremantle, for a subsidy of £130,000 per annum.[1] We may conveniently refer to this service as one of 26 days' sea journey.

Our reference measures increase of speed by knots, but we propose to express the acceleration in terms of days saved. This is desirable because speed must be adjusted to the hours of arrival at the ports *en route*, and the addition of, say, one knot might make little difference to the actual period of the voyage. For the sake of convenience in bunkering and in working mails and cargo as well as of making the stay in port attractive to passengers, Colombo must, if possible, be reached in the forenoon and Fremantle at daybreak. It is clear, therefore, that the saving of anything substantially less than a day on each of the longer stretches of the voyage, namely, Suez to Colombo and Colombo to Fremantle, would give a time of arrival inconsistent with working the service to the best advantage and would not be fully effective. We propose, accordingly, to limit our consideration to such increases of speed as would reduce the time employed for

[1] The Subsidy of £252,500 por annum paid by the Imperial Government to the P. & O. Company is for combined Indian and Australian mail services.

each of these sections of the voyage by units of one day.

The existing contract with the Orient Company involves the maintenance on these two sections of an average sea speed of between 14 and 15 knots. In order to gain 24 hours between Suez and Colombo and a similar period between Colombo and Fremantle, we find that it would be necessary for vessels to maintain an average sea speed approximately two knots faster than at present ; that is to say, a saving of two days between Suez and Fremantle would mean an increase in the average sea speed on both sections to over 16 knots, a saving of four days would demand an increase to over 18 knots, and of six days to over 20 knots. It must also be noted that since all these are the *average sea speeds* requisite to be maintained regardless of weather conditions, and since delays in port or elsewhere must be retrieved, a substantial margin requires to be added to each in order to make them comparable with the *fair weather speeds* of typical vessels.

Under the P. & O. service, the mail vessels proceed direct from Marseilles to Suez ; after passing the Red Sea, they deviate to Bombay; to disembark the Indian mail, and thence proceed to Fremantle by way of Colombo. Owing to the call made by the Orient Company at Naples, the P. & O. save a day by their direct run from Marseilles to Suez. The deviation to Bombay involves them in a delay of two days as compared with the Orient's

direct run from Suez to Colombo, but the consequent aggregate loss of 24 hours is made up by faster steaming, which enables the P. & O. boats to arrive at Fremantle on the same day of the week as the Orient boats.

We have already indicated the stages of possible acceleration in the Orient service. In the case of the P. & O. Company the present deviation to Bombay introduces elements of complication, but we understand that it is their intention, as soon as may be, to revert to their pre-war practice of transhipping the Indian mail from their Australian steamer at Aden. If a South Italian port were used for mail embarkation, the itineraries of the two services and their possibilities of acceleration would be identical. If, however, Toulon or Marseilles must be retained as the mail port, the call by the Orient Company at Naples would still constitute a difference between the two services. We learn from the Orient Company that they would be reluctant to omit this call, as it would mean the withdrawal of the British flag from the passenger trade between Australia and Italy and a considerable loss of earnings.

Acceleration on the Land Section of the Suez Route.—So far we have dealt with the ocean transit ; but of the total distance from London to Melbourne, the land sections from London to Taranto and Fremantle to Melbourne account roughly for 3600 statute miles or nearly one-third of the journey. It is abundantly clear that any considerable acceleration

of the service to Australia must be by combined effort on sea and land so as to involve the minimum of expense, for normal railway speeds offer greater possibilities of acceleration at a low cost than do normal steamer speeds.

The Mediterranean port of mail embarkation for the service provided by the Orient Company is at present Toulon. If it were possible to revert to Taranto, which was their mail port before the war, the call at Naples for freight and passengers would be outside the actual mail transit. The avoidance of this delay should enable a saving of some 41 hours [1] to be effected on the mail transit, assuming the restoration of the pre-war railway service through Italy. If, in the case of the P. & O. Company, Brindisi or Taranto were substituted for Marseilles and the deviation to Bombay omitted, the two companies would be placed on precisely the same footing, and equality of speed would give equality of transit.

The same trains which carry the Australian mails to Marseilles or Toulon, also carry the Indian and Far Eastern mails. Any reversion to an Italian port for Australian mails must necessarily mean a similar reversion for Eastern mails. We have not consulted the Indian Government on the subject, but we have no reason to suppose that they would be averse from any arrangement which would at a

[1] The present service, London-Toulon-Port Said, takes 153 hours. Before the war the service, London-Taranto-Port Said took 112 hours.

reasonable cost reduce the time taken to convey mails to and from India.

The reversion to an Italian port would obviously involve an increased expenditure for the conveyance of the mails by rail, but we hope that it may be possible to negotiate for this conveyance at an additional charge not out of proportion to the benefits to be derived from the saving of time. Moreover, some portion of the additional expense could be avoided if the preliminary mails were sent via Marseilles or Toulon, where the mail boats would no doubt continue to call, and only the final mails via Brindisi or Taranto.

It has been suggested to us that Malta might serve as a suitable point for mail transhipment, the mails being taken by land to Syracuse via Rome and thence by sea to Malta. We have in consultation with the Colonial Office and the General Post Office examined this proposal, and we regret we are unable to recommend its adoption. The mail transit to Taranto would only take about 2 days, as against perhaps $3\frac{1}{2}$ days to Malta, while the distance from both points to Port Said is roughly the same.

At the Australian end of the voyage, the land transit from Fremantle to Melbourne is 2169 statute miles. The difficulties of the Australian Trans-Continental journey are enhanced by several changes of gauge, and there is no doubt that the establishment of a uniform gauge would enable the journey to be made more rapidly. We understand that the Australian

Governments have this matter under consideration and are fully alive to the necessity for a unification of gauge on both economic and other grounds. At present this journey occupies some 85 hours (including stops) and the average speed is 25½ miles. An average speed of 30 miles per hour (including stops), would mean a saving of 12 hours and of 35 miles per hour, a saving of nearly a day. The mail train does not leave Fremantle until some 15 hours after the normal time of arrival of the mail boat. No doubt it is necessary to regulate the time of departure, so as to ensure arrival at break of gauge points at times convenient for the transfer of passengers; but it would seem that there should be room for the saving of something like a day, by an earlier despatch from Fremantle and a rather faster run across the continent.

It is evident, therefore, that the acceleration of the Australian mail service raises questions of both land and sea carriage. It would appear that if the new steamers now building can maintain an average sea speed of something over 16 knots, or existing steamers can be rendered capable of such a speed, a saving of 4 days may be effected, partly by reversion to Taranto, and partly by the quicker sea transit. To save an entire week of the mail transit, however, it would be necessary not only to speed up the continental railway journey in Australia by some 24 hours and to revert to a South Italian port for mail embarkation, but also to build an

entire fleet of new steamers capable of maintaining an average sea speed of over 18 knots between Suez and Fremantle. We would again observe that for the reasons stated, the maintenance of any given sea speed and the punctual delivery of mails demand a speed capacity under fair weather conditions of from one to two knots higher. We shall consider later to what extent these possible accelerations would be effective in practice, having regard to the exigencies of mail despatches and receipts.

Having discussed the effect of increased speed on the size of vessels, the Report proceeds :

Port Accommodation for Large Ships.—In arriving at these conclusions, we have assumed that the accommodation at the ports *en route* would be adequate for vessels of these dimensions, and that, as the size of steamers increases, Canal and Harbour Authorities will meet their requirements. We understand that, at the present stage of their development, certain ports at either end of the voyage might present difficulties for passenger vessels of the dimensions and design associated with 20,000 tons gross and over. At Tilbury, the existing dry dock accommodation is inadequate for such vessels, and, if London were to be retained as a terminal, they would have to proceed up river at the cost of extra risk and delay. In Australia, Brisbane, and under unfavourable conditions of weather, possibly both Fremantle

and the Outer Harbour at Adelaide, might present difficulties of another order. In the case of large vessels, the greater height of superstructure proportionately increases the superficial area of the ship's side and consequently the effect of windage, to the prejudice of berthing operations and of handling in narrow channels. This difficulty of increased windage calls for the provision of adequate tug power and, at certain ports, of wind screens. In point of fact, these problems of port accommodation are already pressing. The P. & O. have recently launched a vessel of over 600 feet in length and 21,000 tons gross register for the Australian trade, and it has been announced that the Orient Company are building two vessels of 650 feet in length and 20,000 tons gross register. We have communicated with the authorities at the ports which we have mentioned, drawing their attention to these developments and asking to be informed what steps they are taking to meet them. We believe that both here and in Australia, the Port Authorities contemplate schemes to meet the growing requirements of shipping.

The Effect of Increasing the Frequency of the Service.—If what we have said is true of an accelerated service on the basis of the present frequency of despatch, it follows that any increase of frequency would entail almost pure dilution in the saloon passenger earnings per steamer. If, for instance, it were proposed to double the existing services and to restore

the pre-war weekly despatches, the cost of duplication would not be merely double the subsidy required for the present four-weekly services, but that subsidy plus a very large proportion of the gross cost of the additional despatches. One half of the service, unless and until Australian passenger traffic showed a remarkable expansion, would secure its revenue for the most part at the expense of the other half. We referred to the necessity for the timely delivery of documents of title relating to goods. If at any given rate of mail speed, this were not secured it follows from what we have just said that it would be obtained with a less expenditure by increasing the mail speed rather than by increasing the frequency of despatch.

Before the war, the P. & O. and Orient Companies maintained between them a weekly mail despatch. This fact seems rather to conflict with our conclusions as to the effect of increasing the frequency of the service. Conditions to-day, however, differ from those before the war. The size of mail steamers is increasing, without a corresponding increase in the saloon passenger traffic which provides a large portion of the revenue, especially in the case of the P. & O. where no third-class passengers are carried ; the services via the Cape of Good Hope have been made more attractive for all classes of traffic ; there is fresh competition both on the Suez and the Cape routes ; there has been a serious decline in short distance travel to the Mediterranean

and Egypt; and lastly, since running costs display a ratio of increase higher than do charges, whether for passengers or freight, a higher load factor than before the war is necessary to make ends meet.

The Influence of the Day of Mail Despatch on Acceleration.—We have referred to certain accelerations which appear to be possible in the Australian Mail Service, and we now propose to examine how far these accelerations could be obtained in practice. We have shown that the resumption of Taranto as the Mediterranean mail port, and the speeding up of the mail vessels between Suez and Fremantle would curtail the mail transit between London and Fremantle by four days. With a Thursday mail despatch from London as at present, the mail arrives in Fremantle on a Thursday, and a saving of four days would involve the objection of a Sunday arrival in Fremantle, an objection which is insuperable so long as the labour conditions at that port remain unchanged. If, however, Friday were reverted to as the day of mail despatch from London, this objection would disappear, the steamer in that event making Fremantle on a Monday.

We understand from the General Post Office in London that, under present conditions, it would be very inconvenient to alter the date of mail despatch to Friday, and, further, that a despatch on Tuesday or Wednesday would be acceptable neither to them nor to the general public. Apparently the objections to a Sunday

arrival in Fremantle apply in a great measure also to a Saturday arrival. If, therefore, the difficulty of altering the day of mail despatch from Thursday to Friday cannot be overcome, any acceleration in excess of three days (which would give a Monday arrival at Fremantle) would be of little, if any, use, unless it were such as to ensure a Friday arrival at Fremantle, or, in other words, such as to effect a total saving of six days. It must be noted, however, that the speed capacity required for a four-days' saving, namely, 16 knots, is equally required for a three-days' saving.

Acceleration by Means of Air Services.—In considering the methods of curtailing the time of transit to Australia, the possibilities of securing a saving by the employment of air services must not be neglected. Estimates laid before the Imperial Conference in 1921 put the total time of transit to Australia by airship at some 12 days, and this would obviously mean a saving of quite a different order from any that could be effected by accelerating the existing land and ocean services. We are informed by the Air Ministry that the solution of the technical problems involved appears to present no insuperable difficulties, and that the chief obstacles to the establishment of a direct air service to Australia are financial. There is unfortunately small prospect of an air line to Australia proving self supporting, at least in its early stages.

The first step to be achieved in such an air

service, if heavier-than-air machines were used, would probably be between Egypt and India. If airships were used, the first stage might be a service between England and India, calling at Egypt. Even, however, if the first stage were only between England and Egypt, its importance as bearing on the problem of the Australian and Indian mails is easily seen. Some four days would be saved between London and Suez, where the mails would be transhipped, and if the existing steamers were speeded up to gain two days between Suez and Fremantle, and if, in addition, a day were gained in Australia, it would be possible to save a week between London and Melbourne or Sydney.

Conclusions.—Essentially, then, our conclusions are that with steamers now running or in course of construction and with existing railway facilities, it should be possible at a certain cost by reverting to a South Italian port for shipment of mails to save nearly two days between London and Port Said, somewhat more than two other days by speeding up to over 16 knots between Suez and Fremantle, and possibly one day more by earlier despatch of the mail train from Fremantle and rather faster running across Australia. To gain two further days on the ocean section and this to complete the week, would necessitate the building of new steamers capable of an average sea speed of over 18 knots with a reduced cargo capacity. Alternatively, without building new steamers, it might be practicable before long to

obtain a saving of a week by the carriage of mails by air from Great Britain to Egypt, thereby gaining four days, to which must be added two days saved at sea and the one day in Australia. For convenience of mail despatches and receipts, however, it is evident that under existing conditions of commercial routine and of the working of certain ports, savings of time would be effective if of one, two, three, six or seven days, but not if of four or five. To build a fleet of new steamers capable of 18 or 20 knots, would probably require at least three years from the signing of the subsidy contract, and at no very distant date all calculations might be upset, either by improvement in the internal combustion engine as applied to ships, or by developments in air navigation.

In our opinion, therefore, before any definite decision as to reverting to an Italian port, or of subsidising vessels of 18 or 20 knots, is taken, the possibility of saving a week by subsidising an air mail from Great Britain to Egypt and a 16 knot sea service to Fremantle, and by obtaining a faster railway service through Australia requires careful consideration. We are informed that to make the alterations in existing steamers which would enable them to attain an average speed of over 16 knots would not be a lengthy process, and that vessels which are now building for the trade will be ready to take their part in the service in little more than a year.

APPENDIX V

REPORT OF IMPERIAL WIRELESS TELEGRAPHY COMMITTEE

We have been asked "to consider and advise on the policy to be adopted as regards the Imperial wireless services so as to protect and facilitate public interests." It was impressed upon us that the question was urgent. We did not feel called upon to explore the past or to comment on the delays which have occurred in the building of the Empire wireless chain. We concentrated our attention on essential matters, examining and considering the facts and circumstances which have a direct bearing on policy and the conditions which safeguard public interests.

A vast amount of evidence in existence was placed before us: reports, correspondence, records, explanatory data bearing upon our inquiry. We have also made special investigations to make our information as complete as possible. In order to finish our task in the time expected, some of our members have been at work continuously in collating, analysing material, and preparing our report.

We set forth briefly in supplements to our report the various declarations of policy which have been made by successive governments

on Empire wireless ; also a selection of statements from evidence and reports explanatory of the present situation in this country and abroad which have been before us.

OVERSEA DOMINIONS AND WIRELESS

When it was found that the original all-Empire wireless policy would not be carried out, the chief self-governing Dominions took independent action, so that the construction of an all-Empire chain is not now possible.

Australia.—The Commonwealth of Australia which led the defection, was influenced by its determination to have direct communication with England. It did not accept the limitations put on the possibilities of long-distance wireless by the recommendations of the Imperial Wireless Telegraphy Committee of 1920. It objected to be the end of a chain made up of several links. Another factor in deciding Australian wireless policy was that a favourable proposal for carrying out a scheme was received from Marconi's Wireless Telegraph Company, Limited. The Australian Government has entered into an agreement with Amalgamated Wireless (Australasia), Limited — an associated Marconi Company—to provide the main trunk stations in Australia and the United Kingdom and to arrange for the erection within two years of a station in Canada capable of communicating with Australia. A contract has been placed

with the Marconi Company for building the Australian station. The Australian Government hold 500,001 out of the 1,000,000 Ordinary shares in the wireless company.

South Africa.—The Union Government has entered into an agreement with the Marconi Company, under which a National South African Company is organised which will build and operate a wireless station for communication with England and the rest of the world. The Union Government keeps general control and has made provision for purchase at intervals of ten years.

Canada.—The Government of Canada has issued a licence to the Canadian Marconi Company for the erection of a high-power station at Vancouver, and another at Montreal—the latter in place of the present station at Glace Bay—both capable of being used as parts of the Australian system for communicating with England if direct communication breaks down.

India.—The Government of India desired communication direct with England instead of having messages re-transmitted via Cairo, and has now invited tenders for the erection of its stations from a company which must be national in character and in financial control.

New Zealand and Newfoundland. — It is understood that the New Zealand Government intends to erect its own wireless station. The Government of Newfoundland has taken no action. It is quite easy for Newfoundland to

link up with Canadian stations without erecting a high-power station of its own.

[Fuller particulars of the arrangements made by the Dominions will be found in supplements to this report.]

PUBLIC OPINION IN THE DOMINIONS

The Dominion Governments regarded wireless as the cheapest and quickest means of communication, the only alternative and supplementary service to cables, which they considered as inadequate. The main impelling influence of their action has been the conviction that wireless will improve Empire unity by bringing the people of the British Commonwealth closer together in good understanding and mutual friendship. Wireless they regard as the victory of science over space, as it annihilates distance.

The people of the Dominions were also disappointed to find that news and propaganda matter reaching distant British possessions and Far Eastern countries came from foreign services, and that visitors sailing from the Antipodes had to rely on foreign wireless for news, until their ships came within range of the British stations.

These are among the considerations which have actuated the Dominion Governments and caused among them a certain measure of impatience if not irritation at the delays in the construction of the Empire wireless

chain. The strong demand for an urgent settlement of policy was expressed by Mr. Bruce, Prime Minister of Australia, in a statement which he made before leaving this country in January last.

VARIATION IN BRITISH POLICY

When wireless telegraphy reached the stage of development which made it a practical new means of communication, the government of the day—in 1911—laid down the principle that Empire wireless should be owned and operated by the State. This policy was not departed from until Mr. Bonar Law's declaration of March 5, 1923.

Reasons for Change.—The Prime Minister then stated in the House of Commons that it "was not considered necessary any longer to exclude private enterprise from participation in wireless telegraphy within the Empire, and that the government were ready to issue licences for wireless stations in this country for communication with the Dominions, Colonies, and foreign countries, subject to the conditions necessary to secure British control and suitable arrangements for the working of the traffic." Mr. Bonar Law also stated that "in the interests of national security" there should be a wireless station owned and operated by the State capable of communicating with the Dominions, and to this extent there would be competition. The reason given by

Mr. Bonar Law for the new course he recommended was "the development in the science of wireless and other circumstances which had arisen."

Mr. Bonar Law's declaration involved two variations in policy: (1) that private enterprise was to participate in Empire wireless in England, and (2) that there would be an element of competition in the service.

Before this announcement was made, the Marconi Company had, either directly or through affiliated companies, entered into agreements, already referred to, with the Australian and South African Governments.

Post Office new Super-Station.—Simultaneously with the Prime Minister's announcement of the new policy, the Post Office began making arrangements for the erection of a new super-station equal in power to any in the world. A site was chosen near Rugby, and the work of erection started without delay.

NEGOTIATIONS WITH MARCONI COMPANY

Following upon Mr. Bonar Law's declaration of this new policy, the Marconi Company applied to the Postmaster-General (Sir William Joynson-Hicks) for a "general licence." Negotiations began in a friendly spirit. On May 8 the Postmaster-General rejected the company's application for a "general licence" for the reason "that if granted it would give the company a monopoly of the wireless

services of the world so far as Great Britain is concerned, and would virtually exclude from those services both the government itself and any other company who might wish to take part in wireless enterprise."

Company's Interpretation of New Policy.—The company in their reply did not admit that arrangements under a general licence would either exclude government competition —which was intended to be an indispensable part of the Bonar Law policy—nor the issue of licences to other companies. They said that their interpretation of the statement of policy made by Mr. Bonar Law did not convey to them the understanding that the Post Office would be taking so important a part in the conduct of wireless commercial services as they gathered it was now intended.

Delays in Negotiations.—Negotiations continued between the Postmaster-General and the Marconi Company from March, 1923, to January, 1924. We have read all the correspondence, which was carried on without undue haste, interrupted at intervals by conferences between the representatives of the Post Office and of the Marconi Company, which did not, however, expedite matters. At times negotiations took a turn which suggested that a settlement was at hand, and so the House of Commons was informed more than once. But always some new point cropped up unexpectedly, and negotiations were broken off, to be resumed after an interval.

Suggested Working Arrangements.—Various schemes were discussed, including free competition between the State and company-owned stations, a regional division of the services, a complete pooling arrangement under unified management with the Post Office as predominant partner as regards control, and a partial pooling arrangement. A careful reading of the correspondence leads us to the conclusion that it is exceedingly doubtful whether any agreement on the several lines which were under discussion would ever have worked satisfactorily.

Ineffective Negotiations.—"The suitable arrangements for the working of the traffic," as mentioned by Mr. Bonar Law in March, 1923, were found to be more difficult to adjust than was contemplated. It was intended, and hoped, that the new policy, sanctioning the participation of private enterprise in Empire wireless, would facilitate progress. Nine months' negotiations without a settlement having been reached is a disappointing result. A combination of State and private ownership, even under unified management, could not, it appeared, be settled to the complete satisfaction of both parties. It was impossible to retain the element of competition in commercial wireless which was provided for in the Bonar Law policy, and at the same time have unified management with pooling arrangements.

A Deadlock.—When we began our inquiry

we found that the nine months' negotiations had ended in a deadlock. In justification of this statements we append copies of letters which passed between the Marconi Company and the Postmaster-General, dated January 7, 21, and 26. The Postmaster-General, in his letter of January 21, referred to important points which had been discussed in previous correspondence, but not settled, and the Marconi Company in their reply introduced an issue of vital importance, as it challenges the authority of the Post Office to refuse the company a licence or to attach to that licence certain conditions. The statutory powers of the Postmaster-General appear to us to be against the contention of the Marconi Company. This interruption of negotiations is a continuation of the misfortunes which have dogged the footsteps of Empire wireless and caused the lamentable delays which have placed the Empire behind other nations in the use of wireless telegraphy as an indispensable means of communication throughout the world.

The negotiations between the government and the Marconi Company involve controversies which are outside our province. The settlement of the claims for war services which the company makes against the government, for instance, does not concern us.

The Question of Patents.—With regard to patents which figure a good deal in the correspondence, we would only observe that if the Post Office does not possess the right to

use all patented inventions available in this country, which are considered necessary for the efficient operation of the wireless service, then steps should be taken by arranging for the payment of royalties for the use of such indispensable patents, or by taking action under section 8 of the Patents and Designs Act of 1919, which gives the State power to use a patented invention, provided a fair price is afterwards fixed by agreement or compulsory arbitration.

Lamentable Consequences of Delay.—In view of the legal issue raised by the Marconi Company in their communication of January 26, we saw no prospect of satisfactory settlement by reverting to any of the bases upon which negotiations had proceeded ineffectively for nine months. We felt it our duty to keep in view the supreme urgency of recommending a policy which could be carried into effect without delay. Further delays which have occurred will cause intense dissatisfaction in the Dominions. A scheme which can be decided upon without further postponement and which will work effectively, giving cheap, efficient and adequate service, should commend itself to public opinion.

CASE FOR PUBLIC OWNERSHIP

The public ownership of all wireless stations in Great Britain on the principles of the telegraphs would be an ideal scheme, which we have not, however, considered. Practice has

been in another direction. The pioneer work has been done by private enterprise, and the Marconi Company participates in long-distance and in Continental wireless services under conditions which safeguard public interests.

Existing Wireless Facilities.—In considering the position in regard to the British end of Empire wireless, we reviewed the existing facilities for wireless communications with the Empire. There is only one station belonging to the Empire system in England, that at Leafield, Oxfordshire, and it is not exclusively occupied in carrying on an Empire service. It is not powerful enough to send messages with regularity and certainty to India, or Australia, or South Africa. It communicates with Cairo daily, but that is the extent of its capacity for regular service eastward. On the other hand, it carries on a successful service with Canada. A new medium-power station at Northolt, Harrow, also transmits a certain number of Press messages during the night hours to Halifax, Nova Scotia.

Leafield Station.—The high-power station at Leafield (with receiving station at Banbury) is the British end of the unfinished Empire chain. It was designed in 1913. Its erection was interrupted in December, 1914, when the contract with the Marconi Company was cancelled. Construction was not resumed until 1919. The masts which had been erected in 1914 were then utilised, but the station was finished according to revised plans. Leafield

began business in May, 1922. It communicates with the corresponding station at Abu Zabal near Cairo—the second link in the Empire chain — and transmits a daily average of about 2350 words. Messages which are intended for Iraq, Palestine, and Syria, where there are receiving stations, are relayed from Cairo. Some of the messages are retransmitted by cable from Cairo. Leafield is also used for broadcasting British official messages. News messages are sent to India, but cannot be relied upon owing to frequent atmospheric interruptions. Leafield is also used for sending long-distance communications to ships at sea. It also transmits some 35,000 words of news weekly to Halifax, Nova Scotia, for a group of American and Canadian newspapers. Its total outward traffic is between 70,000 and 80,000 words a week.

Financial Results of Leafield.—The capital expenditure on the Leafield station up to the end of 1923 was £132,362 ; the amount set aside for depreciation was £19,655—leaving a net outstanding capital liability of £112,707. For the financial year ended March, 1923, including 11 months' working of the station, the revenue amounted to £37,623, and the expenditure to £43,745, showing a deficit of £6122. Interest and depreciation (included in this expenditure) for the period amounted to £13,910.

We have been supplied with the results for nine months ended December, 1923. For

that period the revenue was £30,296, almost the same monthly average as for the previous period, and the expenditure amounted to £33,211, the result being a loss of £2915. It is probable that by the end of this financial year this adverse balance will have disappeared. At any rate, working expenses will be much more than met. Interest and redemption charges for the year will amount to £14,000. Of the revenue of £30,296, payment from the Foreign Office for news bulletins and other government departments amounted to about £8000, but these tolls would have been payable if Leafield had been operated by a company. As this is only the second year of a station which was not constructed on the most modern lines, we consider that the results are satisfactory.

A single station is handicapped by the heavy establishment charges it has to bear, and in the case of Leafield the volume of incoming messages is small owing to the absence of corresponding high-power stations overseas.

Cairo Station.—We are not favourably impressed with the prospects of the Cairo station. For the financial year 1922-23, during which it had been in operation 11 months, the expenditure was £44,315 and the revenue only £6521, leaving a loss of £37,794 on an outstanding capital expenditure of £143,871, The last nine months ended December showed some improvement. The revenue was £7071, the expenditure £33,526, and the loss £26,455.

It is true that Cairo is a terminal station at present. It is further handicapped because it is not duplex, and therefore cannot transmit and receive messages simultaneously.

Future of Cairo Station.—The Cairo station serves for strategic as well as commercial purposes. It is used by the Admiralty as a link between Malta and Aden. Under other conditions, no doubt the Cairo station can be made profitable, but we recommend that as soon as the requirements of the Navy are met and a high-power station built in India, this station be removed from the Empire chain.

Northolt Station.—The new medium-power station at Northolt, which is partly used for Empire work, showed a deficit of only £200 for the year 1922-23. The capital expenditure was £42,296; the revenue £6797, and the expenditure, £6997. The results for the nine months ended December, 1923, are disappointing, as the revenue fell to £4360, and the loss increased to £3470, owing chiefly to the fact that an Italian station with which it had been communicating went out of commission. Other traffic, however, has now been secured, and we are informed that since the beginning of this year this station has been paying its way.

We may point out, in comparing the commercial results of a State-owned and a privately-owned enterprise, that the accounts of private wireless companies do not enable us to separate the results of their communication services

from their manufacturing and other activities —much less to estimate the results of individual stations.

NEW EMPIRE STATIONS REQUIRED

In the light of the experience gained during the last two years by the Post Office in managing long-distance traffic, we reviewed the position in order to estimate the requirements of the immediate future. The assumption which ran through the correspondence between the Postmaster-General and the Marconi Company is that Leafield station, as it stands, the new Post Office station now in course of erection at Rugby, and two new stations erected by the Marconi Company would be adequate in the near future for handling the British end of Empire wireless.

Enlarged Rugby Station.—The engineers and traffic experts have reported to us again on the position, and favour some modifications in the constructional programme. The Rugby station as planned has 12 masts 820 feet high, with an aerial 1½ miles long and about half a mile wide. The engineers now report that this station should be provided with 16 masts, which, with other contingent improvements, will involve an additional estimated cost of £62,000.

Modernised and Enlarged Leafield.—The engineers recommended that the Leafield station should be modernised at a cost of £60,000.

The masts, at present 300 feet high, would be made 600 feet high, and all the other necessary improvements for increased capacity would follow.

Another World-Power Station.—The engineers also state that a second Rugby is necessary to cope with Dominion traffic in the immediate future, and that provision should be made for another station to deal with radio-telephony, which would be used for Empire purposes to some extent. We think, however, that this should be postponed pending the results of the trans-Atlantic experiments in radio-telephony which are now being carried on.

Capital Expenditure Required.—As policy with which we are primarily concerned may be affected by expenditure, we may state that the provisional estimates for the extension of Rugby and Leafield stations and the construction of the two additional stations mentioned amount to a total of £875,000, of which £250,000 is the estimated cost of the radio-telephony station. We would point out that this expenditure would provide work for many skilled workers and labourers in the steel and engineering trades.

COMMUNICATION WITH COLONIES AND PROTECTORATES

The schemes considered and planned for Empire wireless services have been limited to grand trunk routes. Linking-up connections

with the Colonies or intercolonial lines have not been taken into consideration.

French Colonial Wireless.—The French Government has a State wireless service which embraces all the French colonies. Some particulars are given in our supplementary statements of this great colonial wireless network, which has been set up at an enormous cost, showing how seriously France regards her colonial obligations. This colonial service reaches such far-distant places as Indo-China, the West Indies and French Guiana, Réunion and Madagascar. It is particularly complete in Northern and Equatorial Africa. We also give some information relating to the French commercial wireless companies.

Needs of Our Colonial Territories.—In the case of the British Empire, the self-governing Dominions are looking after their own wireless, external and internal. But the widely-scattered colonies and protectorates of the Empire—in the four quarters of the globe, including vast regions with settlements cut off from the means of rapid communication and isolated island territories—should be served by minor links in an Empire chain.

Complete Empire Network.—We suggest that in order to complete the Empire scheme, the expert Wireless Telegraphy Commission be requested to prepare a report on the extent to which receiving stations should be set up in the Colonies, what expenditure would be required, and also to give estimates for feeder

stations, so as to build up a complete Empire network.

The West Indies.—In the case of the Lesser Antilles and British Guiana—a group of territories between which the means of rapid communication was inadequate—the government have already taken action. Wireless will be used to supplement cables, linking up the smaller islands by means of a central station at Barbados. These islands, as well as Jamaica, Trinidad, and British Guiana, will receive news, official communications, and other messages direct from the government high-power stations in England.

POLICY IN EMPIRE WIRELESS

Having reviewed the progress and results of facilities for Empire wireless, and come to conclusions regarding future requirements, we are in a position to advise on the policy which, in our opinion, should be adopted in order to put plans in operation without further loss of time. As we have indicated, we see no prospect of success on the lines of the policy which have been explored and discussed at much length and in great detail during the last nine months.

State Ownership.—We therefore feel justified, alike on the merits of the case and for reasons of expediency, to favour the only alternative and recommend that the Post Office—under conditions which we shall propose—should

erect, own, and operate the Empire wireless stations in England, with an alternative proposal in the case of Canada.

Special Case of Canada.—Canada, while forming part of the Empire scheme, has always received separate treatment.

(*a*) The chain of stations planned in 1913 did not include Canada, probably because the Marconi Company were already providing a service with that Dominion and because at that time wireless science was not equal to bridging the Pacific, a distance of about 6500 miles, between Australia and British Columbia.

(*b*) The Imperial Wireless Telegraphy Committee in their Empire scheme issued in 1920 made no provision for Canada beyond anticipating its participation.

(*c*) The Postmaster-General in his statement of government policy in January, 1921, made no reference to Canada, except to say that Canada was itself dealing with the problem.

(*d*) The resolution passed on wireless at the Imperial Conference in 1921 stated that the Government of Canada should co-operate with the other Dominions and the Home Government.

(*e*) The resolution of the last Imperial Economic Conference was of general application, and recommended immediate action all round.

Present Service to Canada.—The service to

Canada was formerly conducted by the Marconi Company from a station in the West of Ireland, and is now conducted from their station at Ongar, in Essex, to their station at Glace Bay, Nova Scotia. This service has been working now for fifteen years. The Post Office station at Leafield, not having scope for eastward traffic, started a competitive trans-Atlantic service to Halifax, Nova Scotia.

Position in Canada.—Several factors peculiar to Canada should be taken into account.

(*a*) The Dominion Government have up to now expressed no intention themselves of erecting or operating wireless stations.

(*b*) The Dominion Government do not own the telegraphs, which belong almost exclusively to the railway companies and the Western Union, except that the government have, by acquiring the Grand Trunk and other railways, become the owners of a large section of the telegraph system.

(*c*) The chief telephone systems are the property of companies.

(*d*) There is also a general interchange of trans-Atlantic communications between Canada and the United States. The Leafield service, for instance, is chiefly for American newspapers, which prefer it because of its speed and accuracy. The messages are, in some cases, relayed from Halifax, and in other cases received direct.

Competition in Canadian Traffic.—The Post Office is prepared to accept as a *fait accompli*

the competitive service to Canada which already exists. The special treatment accorded to Canada in the past leads us to recommend a continuation of the present competitive system as an alternative to the exclusive handling by the Post Office of Canadian traffic. If the latter proposal for exclusive State operation is adopted, we think that it is right and equitable that some consideration should be given to the Marconi Company, who have carried on service to Canada for fifteen years, and have consequently created a goodwill in the business. The company have no legal claim.

Equipment of the New Stations.—It is essential that the new stations be equipped with the latest apparatus. In a transmitting or receiving station, most of the electrical and mechanical inventions are public property, either because the patents have expired, or because the inventions were never patented. But it is essential that the designers and the engineers in control should be free to introduce into government stations any newly invented devices that may from time to time be deemed necessary to ensure efficiency.

In this connection we may point out that the designers of the new government station at Rugby have not found it necessary to plan for the installation of more than a very small number of live patented inventions apart from those made by government servants. We are informed that the patents not already owned by the government are, so far as the

British rights are concerned, owned by the Marconi Company and two other companies.

We would call attention to the valuable provisions contained in section 8 of the Patents and Designs Act of 1919, which preserves for the Crown the right to use patented inventions, and so, while providing adequate compensation to the holders of the patent, ensures that the State shall not be deprived of its legitimate right of user ; and we recommend that this section be freely applied wherever the necessity arises.

Financial Prospects.—An examination of the results at Leafield, which has certain drawbacks to which we have called attention, encourages us to anticipate that within two or three years of their completion the two high-power Empire stations will be more than self-supporting.

While the important test for the success of State operation of Empire wireless should be the commercial one, Imperial, national, and strategic considerations must not be overlooked. Possession of machinery in the hands of the State, which can broadcast over the world, is an asset which cannot be measured by figures. Under private enterprise, the wayside places of the Empire—the unprofitable stations—would not be catered for, except on the payment of subsidies.

Empire Defence Interests.—There is close relationship between a wireless system owned

and operated by the Post Office and the wireless services belonging to the Navy, Army, and Air Force. Wireless is an indispensable service in Empire defence. The Admiralty has stations in many parts of the Empire, and the wireless facilities required by the Air Ministry must keep pace with the expansion of the Air Force. It is needless to explain the advantages of an alliance, or an arrangement, between State Departments operating the similar services.

The Admiralty plays a large part in research, experimental and development, and we can foresee that, as the Post Office responsibilities grow, the association between these two branches of the government will become more intimate, and that, generally, strategic and commercial wireless will become more interdependent.

National Emergency.—We think that it is essential that in all licences to be granted to any private company to operate wireless, the State should reserve to itself the right to take possession or exercise control over the working licensed stations whenever in the opinion of the government an emergency requires it.

Industrial Interests.—In view of the industrial interests concerned in the equipment of wireless stations, we think that every encouragement should be given to the manufacture in this country of the apparatus required for the transmission and reception

of wireless messages, which is in the nature of a key industry.

IMPROVED ORGANISATION

The committee discussed in the absence of Mr. Brown the subject of improved business organisation.

They say they think the considerable extension of State activities that they contemplate can be faced with confidence. They feel that the Post Office is capable of operating all the stations without a partnership or an association, which, in their judgment, would not work harmoniously. The operation of wireless and allied services by the Post Office will demand constant vigilance and ready action. They therefore suggest certain changes in internal administration. The constructional, engineering, scientific, technical and organising work will be on a large scale, and improved organisation will be needed to put the business on an equality with a private corporation. This means that delegation is necessary. The administrative head of the wireless and associated services should be able to act promptly in all matters of business, and the normal routine should be modified to enable this to be done.

The engineering staff must be highly skilled, and the expert section of the engineering department at the Post Office which is building the stations must be made responsible under

the administrative head for running the transmitting and receiving stations, and for their maintenance. This section must keep the stations abreast of developments in wireless invention, and direct contact should be maintained between the wireless traffic management at the Central Telegraph Office, and the wireless section of the engineering department. The administrative head should have the advantage of the advice of experts of a Wireless Traffic Section, who will keep themselves abreast of the newest and best methods of working elsewhere.

The business organisation should be remodelled without disturbing the present system of financial control. The services of the most capable administrative engineering and executive officers in all branches should be obtained under conditions which will attract them and retain their services. The Post Office Advisory Council of business men should be consulted on the question of organisation.

FUTURE DEVELOPMENTS

The report proceeds :

We are impressed with the rapid progress which the application of wireless service is making, both in regard to long-distance telegraphic transmission and to radio-telephony. New inventions, now in an experimental stage, may at any time augment the efficiency of both transmitting and receiving stations

by improved high-speed automatic methods. Any advance in the rate of word transmission would mean an entire revision of estimates for future capital expenditure—as fewer stations would be required—and a reduction in the rates charged for messages.

Estimates have been placed before us, relating to the amount of traffic—based on the business done by cables—which may be expected to fall to the new Empire wireless stations. These estimates can only be approximate, as traffic always tends to grow with the increase of facilities. Given a new service, cheap, speedy, and efficient, Empire traffic will expand in all directions. The interchange of news and opinions between Great Britain and all the overseas Dominions and Colonies will, in itself, amount to many more millions of words per annum. We are informed that apart from the help to trade by speeding up and augmenting inter-Empire communications by wireless, finance and credit will also benefit.

The change from long to short credit will become general when direct and continuous wireless communications are established within the Empire. This improvement will not only render more effective and cheapen the cost of financing Empire trade, but will enable credits to go very much further, by shortening the period for which, on the average, they will be required. With more direct and cheaper facilities for communication, remittances will cost less, trade will be stimulated, and the

turnover of bank credits will be greater. As an illustration, the use of the cable reduced the period for which credit facilities were required in overseas trade.

FOREIGN WIRELESS

In a supplementary report, the committee discuss foreign wireless.

They say that arrangements should be made for an interchange of facilities between Empire and foreign wireless stations. If the working of the Empire stations is interrupted or is unequal to the traffic load for a given period in the day, stations should be borrowed from the foreign service and *vice versa*. Payment for stations borrowed should be at a fixed rate per hour.

As a result of the government's policy, provisional permits were given some time ago to the Marconi Company to start services with countries which were not already being served by the Post Office stations, subject to suitable terms being subsequently agreed to. The company have now four such services—namely, to France, Spain, Switzerland, and Austria. Among the terms provisionally agreed between the parties were provisions for expropriation and for sharing profits. Meanwhile the Post Office is carrying on services with Holland, Germany, Poland, Czechoslovakia, and to a less extent with other countries, by means of its stations at

Northolt, Caister, and Stonehaven. The Stonehaven station is inconveniently situated and is costly to run in proportion to the value of the traffic which it can carry.

The committee relate the history of Stonehaven station, the primary object of which was to provide a means of communication between Aberdeen and the south when the landlines were interrupted. It was intended also for communication with Russia, and to a lesser extent with the Scandinavian countries. It has never since its erection been required for the former purpose, nor is it likely to be so required. The service with Russia has never actually been established. The Stonehaven station has been largely used for experimental purposes, and has provided valuable experience, but the committee see no prospect that it can be made commercially remunerative under existing conditions, because the traffic does not exist, and apparently after five years' operation cannot be got, to make it profitable. The loss on the station for the year ended March, 1923, was £10,070, and for the nine months ended December, 1923, £6586. The revenue for the twenty-one months amounted to £11,245, and the expenditure to £27,901. The committee are of opinion that the Stonehaven station should be discontinued.

The small station at Caister, intended especially for communicating with Holland, has occasionally served as a relief. For the year 1922-23 this station was worked at a

loss of £2667. The deficit for the last nine months was £1253—an improvement, but not sufficient to justify its continued existence. The Dutch administration has undertaken to co-operate in the use of high-speed apparatus on this service, which should bring about a further improvement. The committee suggest that the traffic now carried on by Stonehaven and Caister could be diverted to the new Northolt station, near London, which, with some comparatively inexpensive adaptation, is quite capable of handling it.

POLICY AND PRINCIPLE

With regard to State ownership and private enterprise, the committee say: No principle which we can discover has been followed in the distribution of Anglo-Continental wireless between the Post Office and private enterprise. One factor which led to the establishment of Post Office wireless with the Continent was the ownership by the Post Office of Anglo-Continental cables, as it was thought desirable that the two services should be in the same hands in order that they might be used interchangeably according to the exigencies of traffic. That consideration may apply to conditions existing between this country and Holland and Germany; but the operation by wireless between England and France, Switzerland, Austria and Spain has been handed over, by a previous government (as distinct from

Post Office) decision, under provisional licences to the Marconi Company. Policy, it would seem, has not been founded on any principle. The cables only join shore to shore, and the wire services with Central, Eastern and Southern Europe involve the use of long landlines through intermediate countries, working in conjunction with the cables. The Post Office and Marconi wireless services, on the other hand, range over practically the whole of Europe, and present advantages for communication with the more distant Continental countries which are not so obvious in the case of communications with the nearer or limitrophe countries.

The Post Office has retained, up to now, the exclusive right in the use of foreign wireless telephony, including services to Continental Europe, and also undertakes telegraphic broadcasting. Northolt station now sends daily forty broadcast telegraphic messages containing commercial information to various agencies on the Continent. The business is growing, and promises to be a very remunerative one. The Northolt station is admirably adapted for carrying on this work.

With regard to the Heads of Arrangement which were under discussion with the Marconi Company in regard to the Continental services when the late government went out of office, the committee say: We consider that they are on the whole suitable, except that, in our opinion, a royalty on the company's gross

receipts in respect of Anglo-Continental traffic would be much better than an arrangement for profit-sharing, which would be complicated and likely to give rise to friction. The licence must, of course, contain a provision reserving to the government the right to take over or to control the working of the licensed stations in case of national emergency. It should also provide suitable safeguards as to the British character of the company and matters of that kind. The provisions in respect of extra European services should be generally similar (including, in particular, provisions for expropriation and control), but in this case there should be no royalty on the receipts, inasmuch as the company would here be in competition with the cable companies, who are not required to pay royalties.

IMPERIAL RESOLUTIONS

The committee quote the following resolutions passed at Imperial Conferences as regards Imperial wireless services :

(1) *The Imperial Conference of* 1911 :

"That the great importance of wireless telegraphy for social, commercial, and defensive purposes renders it desirable that a chain of British State-owned wireless stations should be established within the Empire."

(2) *The Conference of Prime Ministers and*

Representatives of the United Kingdom, the Dominions, and India, June to August, 1921 :

> "It is agreed that His Majesty's Government should take steps for the erection of the remaining stations for which they are responsible, as soon as the stations are designed ; that the Governments of Australia, the Union of South Africa, and India should take similar action so far as necessary, and that the Governments of Canada and New Zealand should also co-operate."

The above scheme was accepted by the Prime Minister of the Commonwealth subject to giving full freedom of action to Australia to decide the method in which Australia will co-operate.

(3) *The Imperial Economic Conference, October and November*, 1923 :

> "That this Imperial Economic Conference affirms the importance of establishing as quickly as possible an efficient Imperial service of wireless communication, and is of opinion that the several Governments of the Empire should take immediate action to remove any difficulties which are now delaying the accomplishment of this, while providing adequate safeguards against the subordination of public to private interests."

POWERS OF THE STATE

The committee preface a brief outline of government policy on Empire wireless since

1904 by pointing out that the opinion of the Legislature, when wireless telegraphy was in its infancy, that the powers of the Postmaster-General should be paramount was shown by section 1, subsections (1) and (2) of the Wireless Telegraphy Act, 1904, which provide that :

> 1.—(1) A person shall not establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any British ship except under and in accordance with a licence granted in that behalf by the Postmaster-General.
>
> (2) Every such licence shall be in such form and for such period as the Postmaster-General may determine, and shall contain the terms, conditions, and restrictions on and subject to which the licence is granted, and any such licence may include two or more stations, places, or ships.

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